F 330D/360DXP.24

use and maintenance

FROM SERIAL NUMBER *6001*

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FASSI CRANE

use and maintenance
ORIGINAL INSTRUCTIONS

THANK YOU FOR SELECTING ONE OF FASSI CRANES.

This crane is the result of **FASSI** philosophy: ongoing research, rigorous testing, data verification, and analysis of performances.

Many years of experience has allowed us to grant you the maximum safety of operation together with the optimization of machine performances.

All this represents the core of **FASSI quality system**.

FASSI quality system is in conformity with
UNI EN ISO 9001:2000 (ISO 9001:2000)

FASSI cranes conform with the European Norm EN12999

The fitment of the crane on the vehicle must be carried out in accordance with the instructions given by **FASSI** in the manual for hydraulic crane fitting and the relevant chassis manufacturers directives.

The Manufacturer declines all responsibility and guarantee if the fitting is entrusted to workshops without sufficient technical capability to carry out the work in conformity.

Be sure that the unit has been installed, inspected and tested in accordance with the local legal requirements.

As well as the principal safety norms, this manual contains a description of the crane and the instructions for use and maintenance.

The following instructions refer to mobile cranes in general and must be integrated with the manual for use supplied by the centre responsible for the crane fitting on truck, vehicle or other type of structure.

READ THIS MANUAL CAREFULLY prior to use or any maintenance. A few minutes spent now could save time and labour later.

Always conform to the safety norms and the instructions for use and maintenance contained in the present manual in order to guarantee a long life to the crane.

NOTE
The original version of the present manual is in italian.

The spare parts catalogue for the crane can be viewed in the Internet site: www.fassicat.com

2 CLASSIFICATION OF THE CRANE MODEL

2.1 Generality

The design of this crane has been carried out in respect of fatigue test classification **H1B3 of the EN12999 norm**. The crane can operate, intermittently, with lifting devices other than the hook. The dimensions and the capacity of the implements must be proportioned with crane performances.

2.2 Hydraulic jibs

Hydraulic jibs							
Extension type	Weight=kg	Manual	Weight=kg	Manual	Weight=kg	Manual	Weight=kg
L323	690	NL31	48	PL31	29	QL31	23
L324	800	----------		PL31	29	QL31	23

2.3 Technical data

F 330D/360DXP.24

Lifting capacity	Standard reach	Hydraulic extension	Rotation arc	Rotation torque	Working pressure	Pump capacity	Oil tank capacity	Crane weight	Max. working pressure on the outrigger (Φ 210)	
30,5 tm 299 kNm	**12,30 m**	**7,80 m**	**400°**	**4,84 tm 47,5 kNm**	**30,5 MPa**	**60/80 l/min**	**195 l**	**3800 kg**	**41,6 daN\cm^2**	**F330D.24**
32,8 tm 322 kNm	**12,30 m**	**7,80 m**	**400°**	**4,84 tm 47,5 kNm**	**32,5 MPa**	**60/80 l/min**	**195 l**	**3800 kg**	**41,6 daN\cm^2**	**F360DXP.24**

FASSI

F330D-F360DXP

ST333/G3.08.00

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Technical information
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MASSIMA ALTEZZA SOTTOGANCIO
MAXIMALHOEHE BIS KRANHAKEN
MAXIMUM HEIGHT UNDER HOOK
HAUTEUR MAXIMUM SOUS CROCHET
MAXIMA ALTURA BAJO GANCHO

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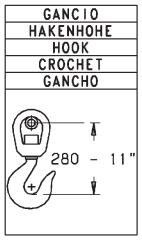

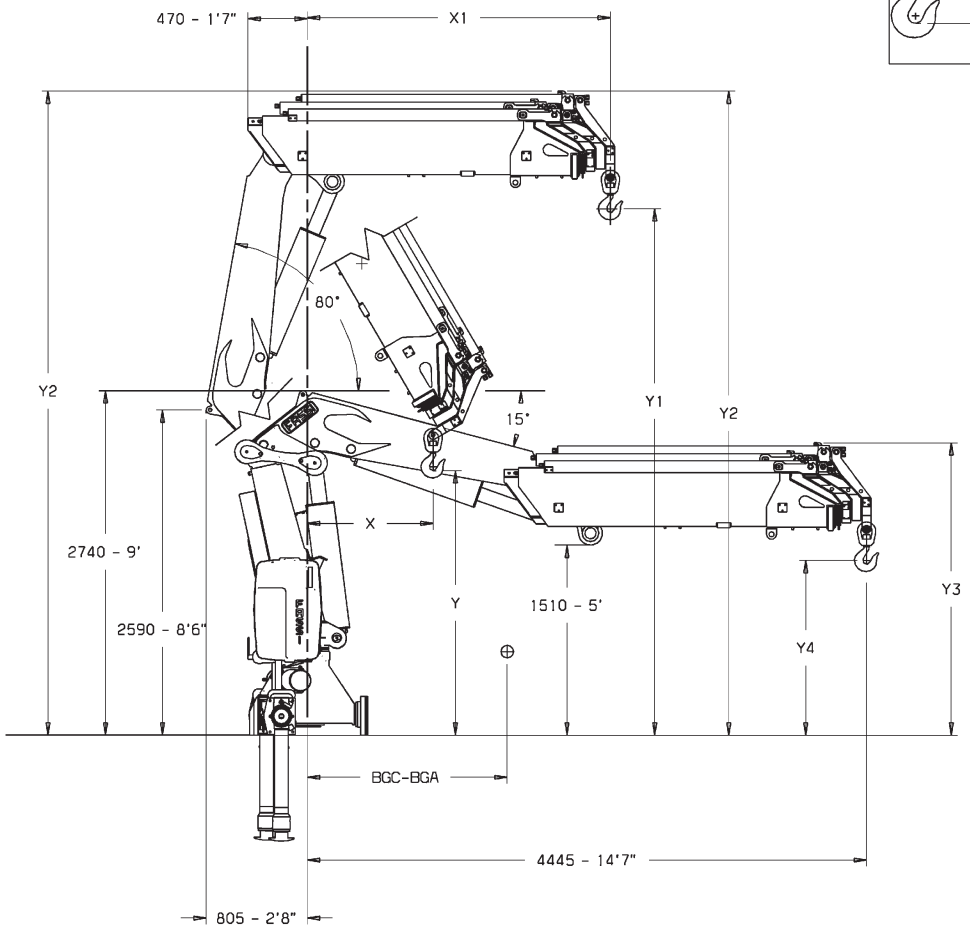

	X	Y	X	Y	X	Y	X1	Y1	Y2	Y3	X4	Y4	BGC	BGA
.22	1000 3'3"	2280 7'5"	1500 4'11"	8'7" 9'	2000 6'7"	3280 11'9"	2250 6'11"	4105 13'7"	5065 16'5"	2265 7'2"	4285 13'11"	1350 4'5"	965 3'2"	1380 4'6"
.23		2190 7'2"		2525 8'7"		3120 11'1"	2330 7'2"	4140 13'8"	" "	" "	4365 14'2"	1370 4'6"	1060 3'5"	1730 518"
.24		2105 6'10"		2420 8'3"		2975 10'5"	2410 7'5"	4160 13'8"	5125 16'7"	2325 7'4"	4445 14'5"	1390 4'7"	1195 3'11"	2315 7'7"
.25		2015 6'7"		2320 7'11"		2835 9'11"	2490 7'9"	4175 13'9"	5180 "	2380 "	4525 14'9"	1410 4'7"	1300 4'3"	2870 9'5"
.26		1930 6'4"		2225 7'7"		2705 9'5"	2570 8'0"	4195 13'10"	5185 16'8"	2385 7'6"	4605 15'0"	1425 4'8"	1380 4'6"	3400 11'1"
.28		2630 8'7"		2080 6'9"		2525 8'3"	2690 8'9"	4235 13'11"	" "	" "	4725 15'6"	1465 4'9"	1500 4'11"	4355 14'3"

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Informazioni tecniche
Technische informationen
Technical information
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Informacion tecnica

PESI, DIMENSIONI E POSIZIONE BARICENTRO
GEWICHTE, ABMESSUNG UND POSITION DES KRANSCHWERPUNKTES
WEIGHT, DIMENSIONS AND BARYCENTRE POSITION
POIDS, DIMENSIONS ET POSITION DU BARYCENTRE
PESO, DIMENSIONES Y CENTRO GRAVEDAD

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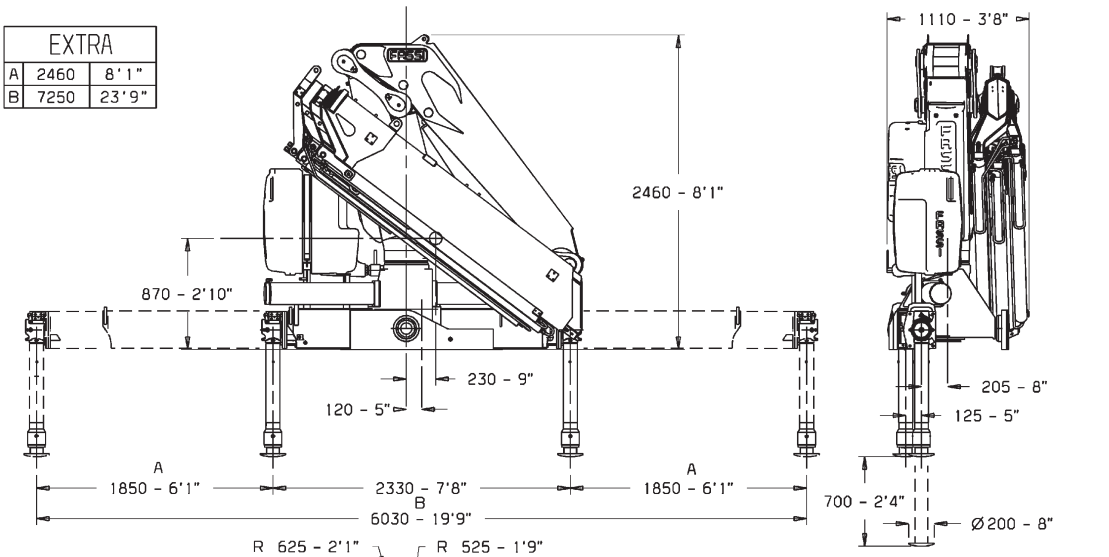
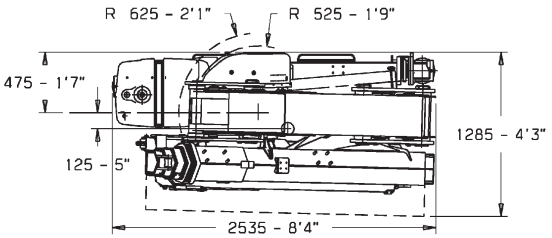
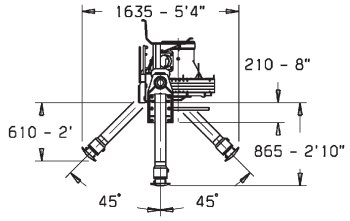
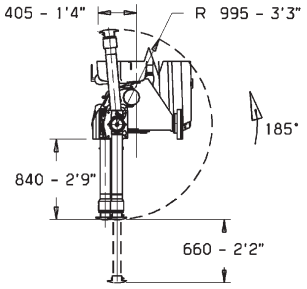
EXTRA		
A	2460	8'1"
B	7250	23'9"

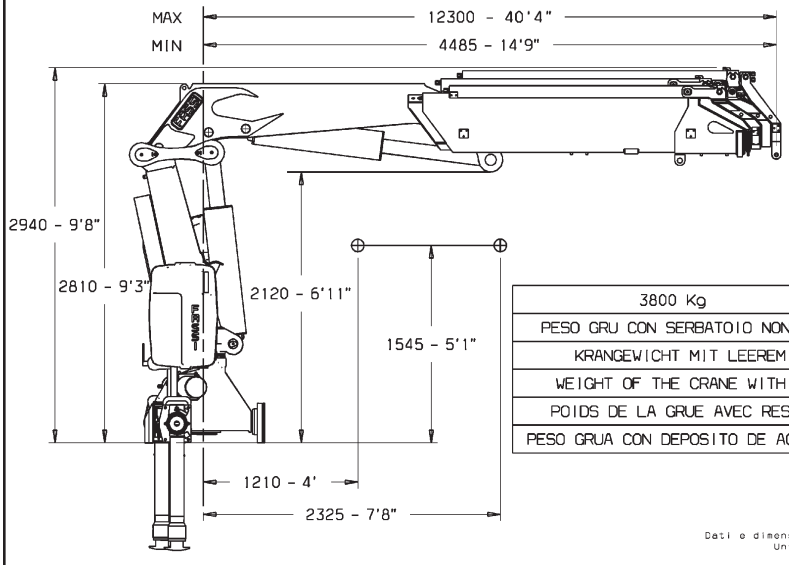




VARIANTE STABILIZZATORI ROTANTI
VARIANTE HOCHSCHWENKBARE ABSTUETZUNGEN
TILTABLE OUTRIGGERS OPTION
OPTION STABILISATEURS RELEVABLES
VARIANTE ESTABILIZADORES ORIENTABLES







kg	+90	lbs	+198
CON TUBAZIONI SUPPLEMENTARI MIT ZUSAETZLICHEN LEITUNGEN WITH SUPPLEMENTARY HOSES AVEC TOUYAUTERIE SUPPLEMENTAIRE CON TUBERIAS SUPLEMENTARIAS			**

3800 Kg	8380 lbs
PESO GRU CON SERBATOIO NON RIFORNITO, STABILIZZAZIONE STANDARD	
KRANGEWICHT MIT LEEREM TANK UND STANDARD ABSTUETZUNGEN	
WEIGHT OF THE CRANE WITH EMPTY TANK, STANDARD STABILIZATION	
POIDS DE LA GRUE AVEC RESERVOIR VIDE, STABILISATION STANDARD	
PESO GRUA CON DEPOSITO DE ACEITE VACIO Y ESTABILIZADORES STANDAR	

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L324-323-/F330D-F360DXP.24

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Informations techniques
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PESI, DIMENSIONI E POSIZIONE BARICENTRO
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Pagina / Seite / Page / Page / Hoja: 01

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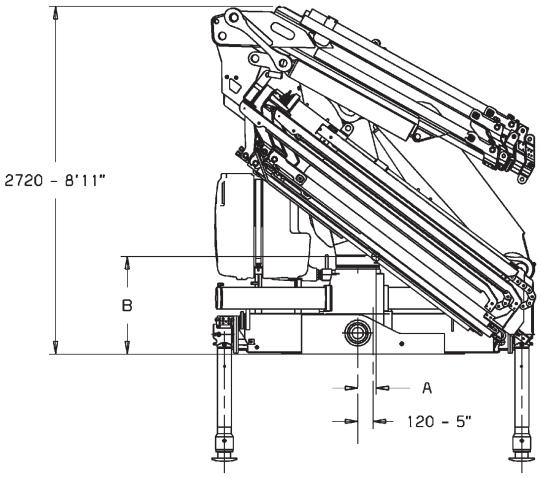
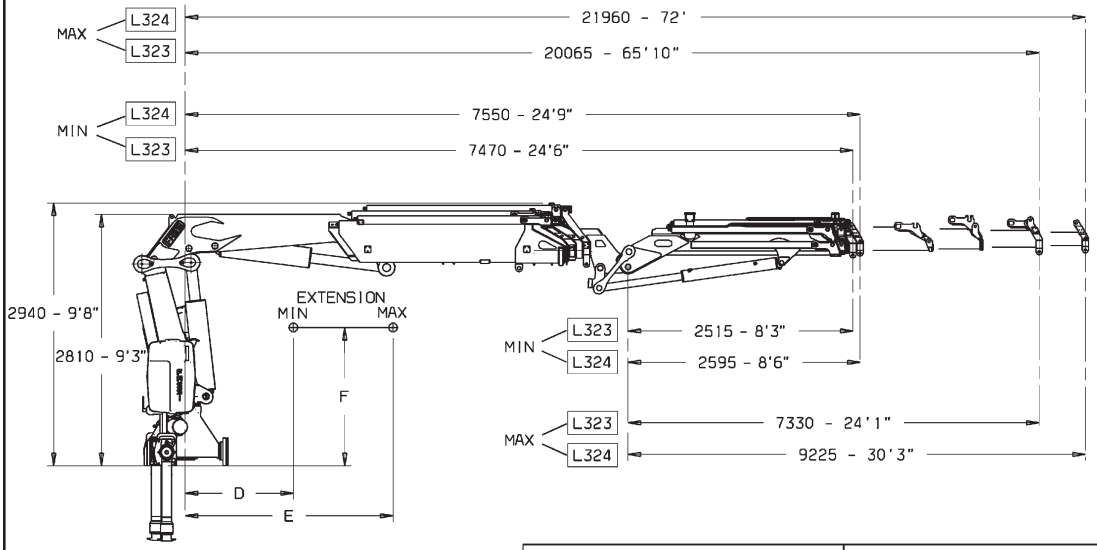


⌖	L323		L324	
A	195	0'7"	205	0'8"
B	1070	3'6"	1090	3'7"
C	175	0'6"	180	0'7"

**	CON TUBAZIONI SUPPLEMENTARI MIT ZUSAETZLICHEN LEITUNGEN WITH SUPPLEMENTARY HOSES AVEC TOUYAUTERIE SUPPLEMENTAIRE CON TUBERIAS SUPLEMENTARIAS



⌖	L323		L324	
D	1985	6'6"	2080	6'9"
E	4425	14'6"	4760	15'7"
F	1700	5'7"	1715	5'7"

L323/F330D.24		L324/F330D.24	
Kg 4700	lbs 10360	Kg 4800	lbs 10580
PESO GRU CON SERBATOIO NON RIFORNITO,STABILIZZAZIONE STANDARD			
KRANGEWICHT MIT LEEREM TANK UND STANDARD ABSTUETZUNGEN			
WEIGHT OF THE CRANE WITH EMPTY TANK,STANDARD STABILIZATION			
POIDS DE LA GRUE AVEC RESERVOIR VIDE,STABILISATION STANDARD			
PESO GRUA CON DEPOSITO DE ACEITE VACIO Y ESTABILIZADORES STANDAR			

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3 CAPACITY PLATES

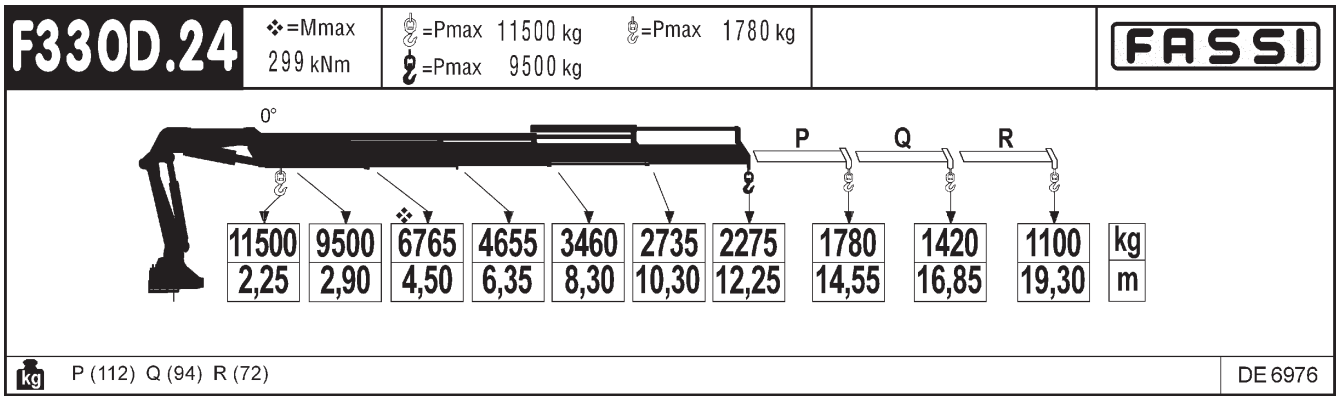
3.1 Generality

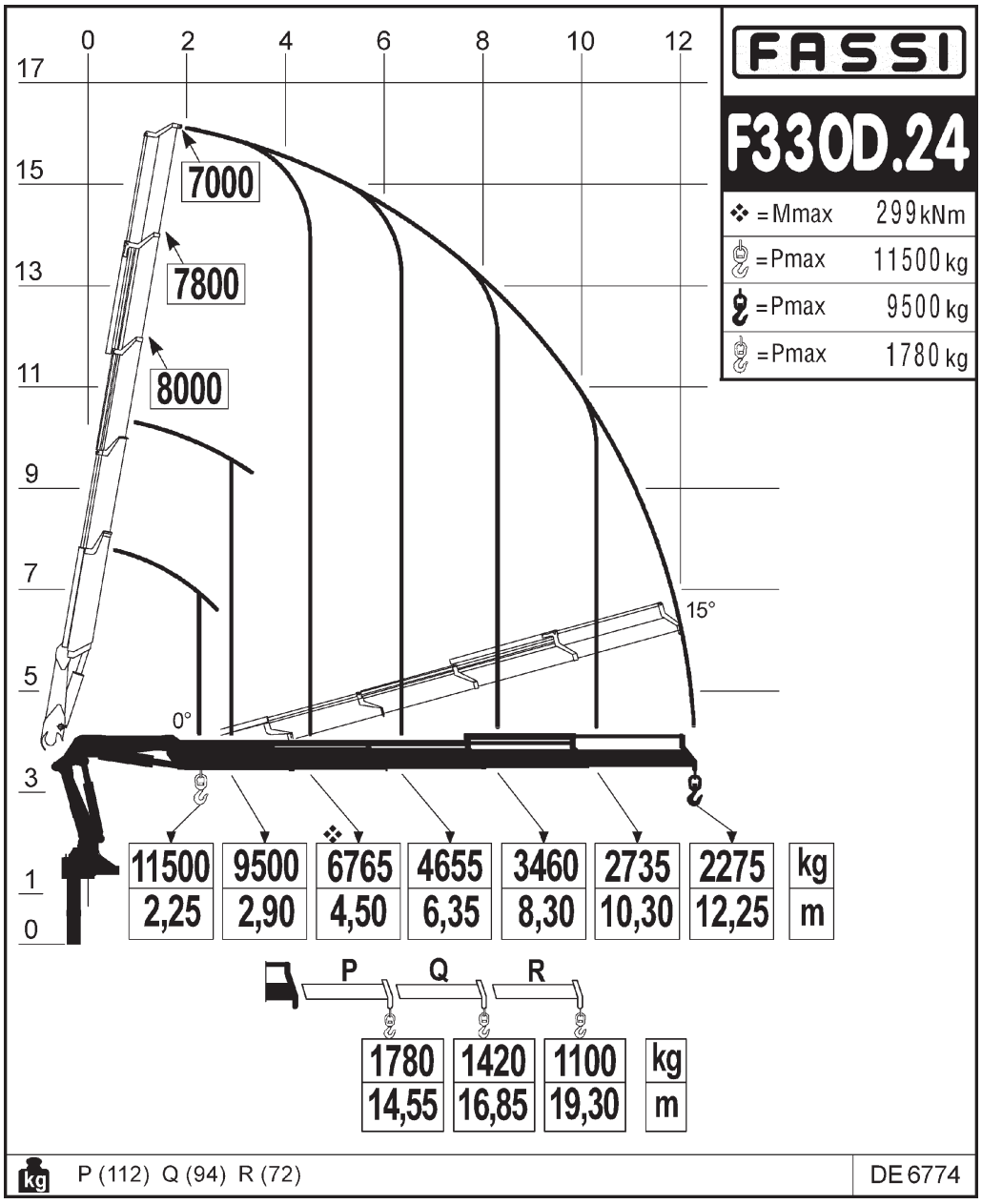
The represented plates refer to the nominal design capacities.

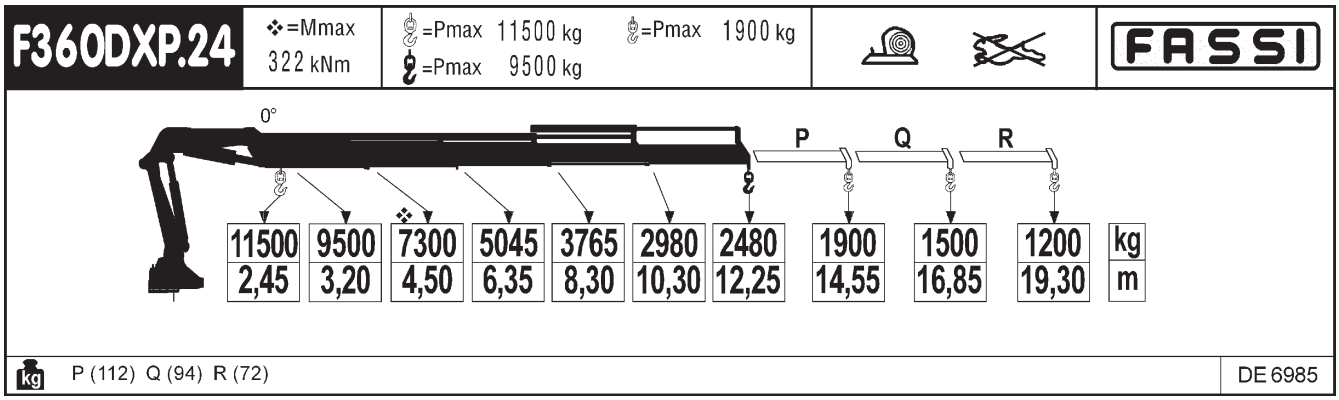
(!) WARNING (!)

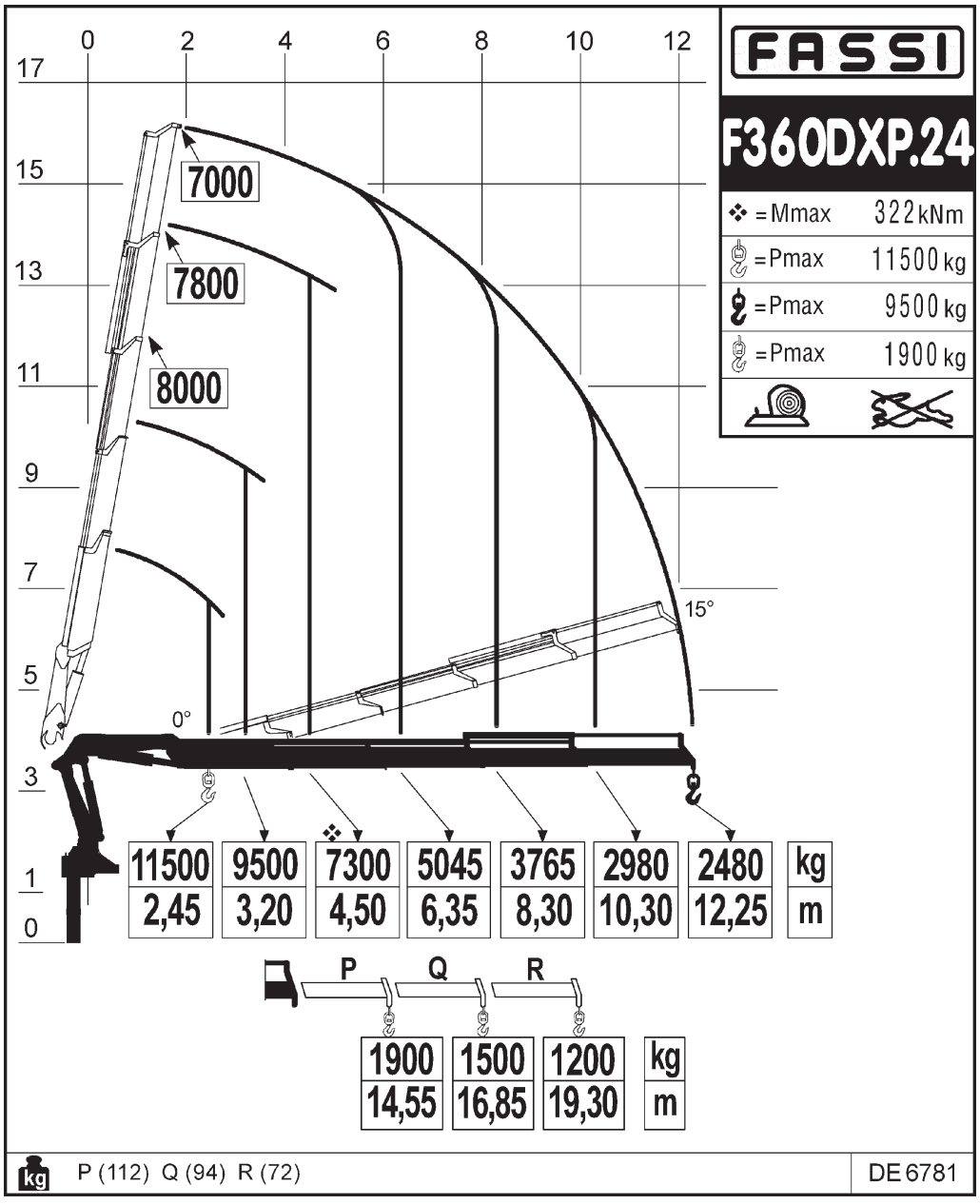
If the capacities are downgraded or partially reduced (e.g. sector in front of vehicle cab) capacity plates must be applied in line with the final test figures.

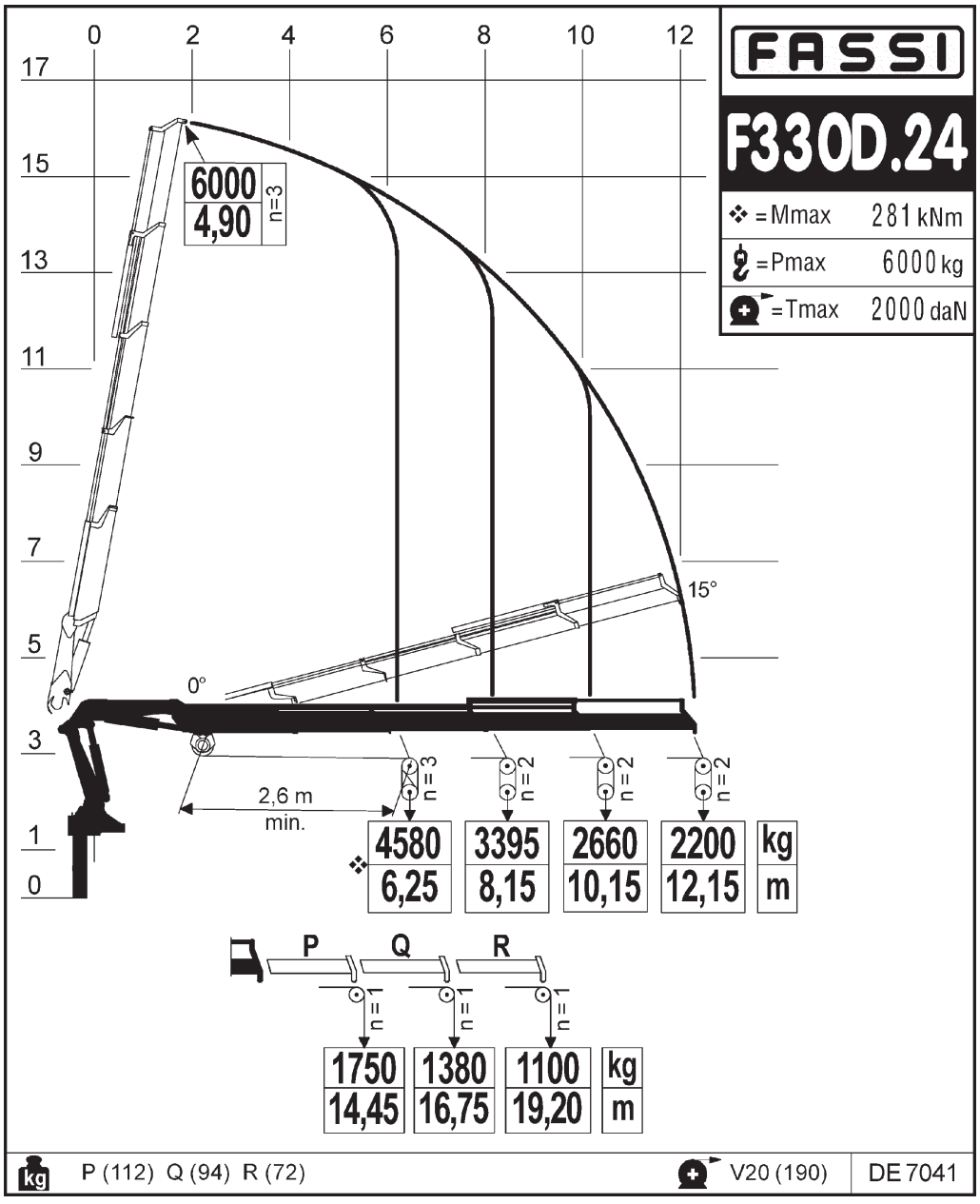
3.2 Capacity plates with lifting moment limiting device

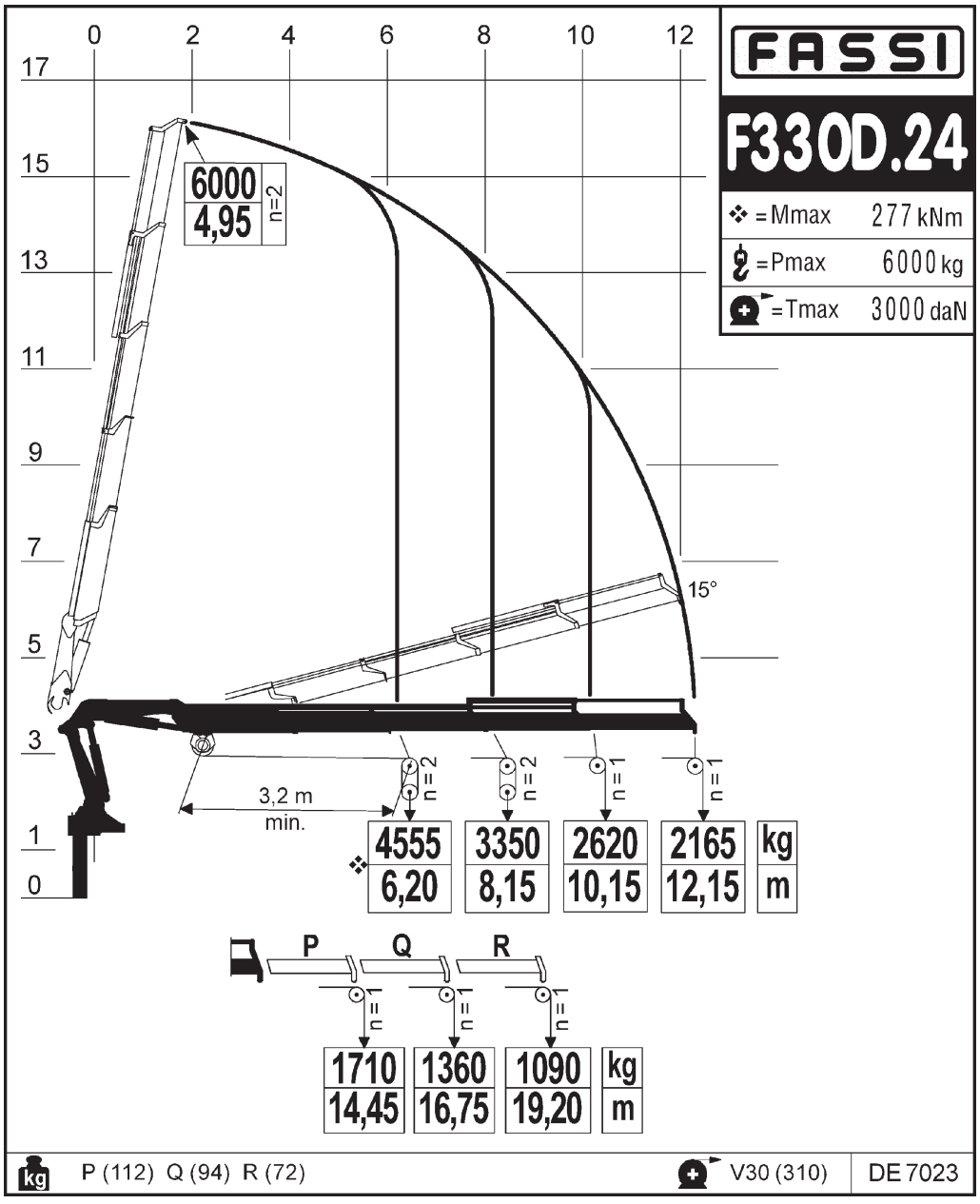


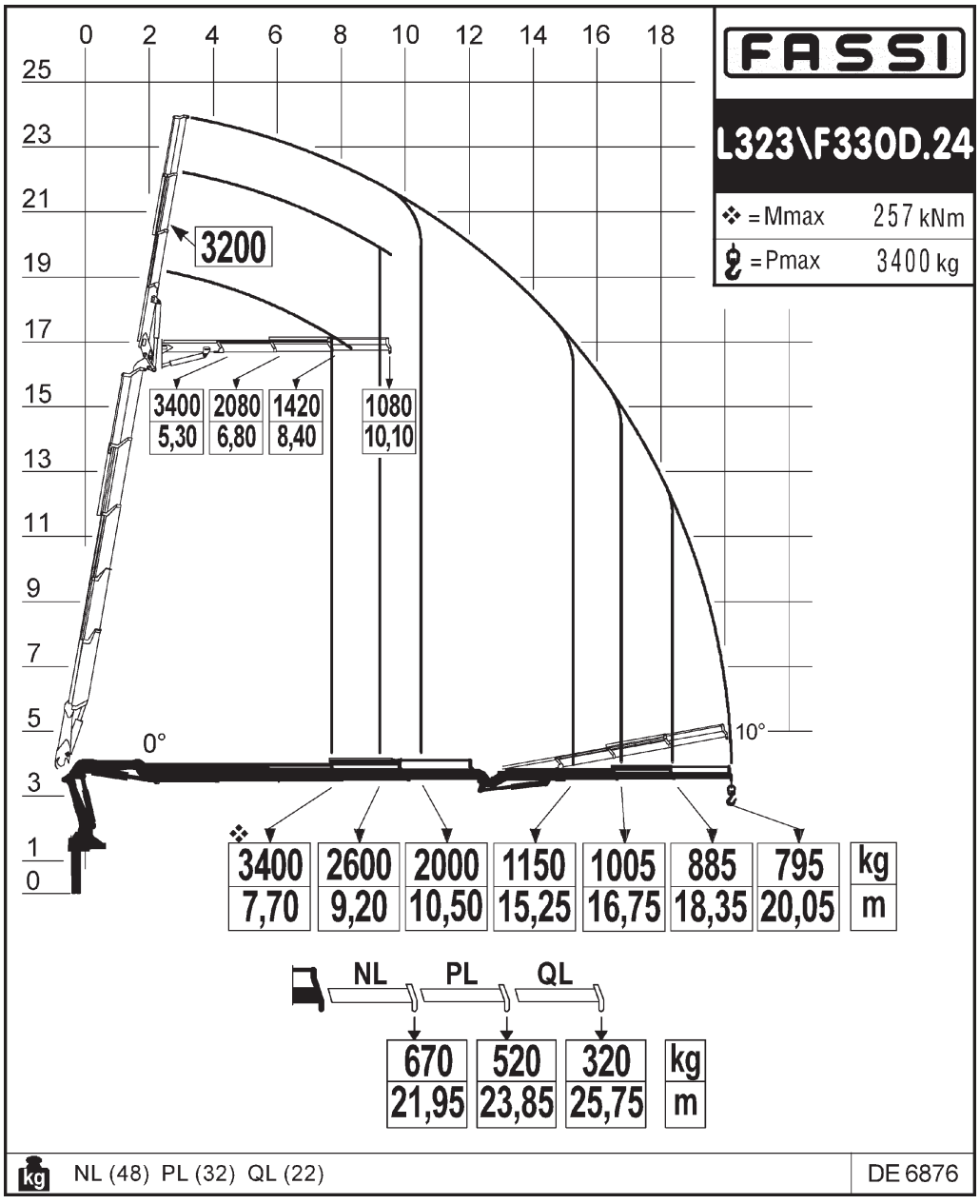


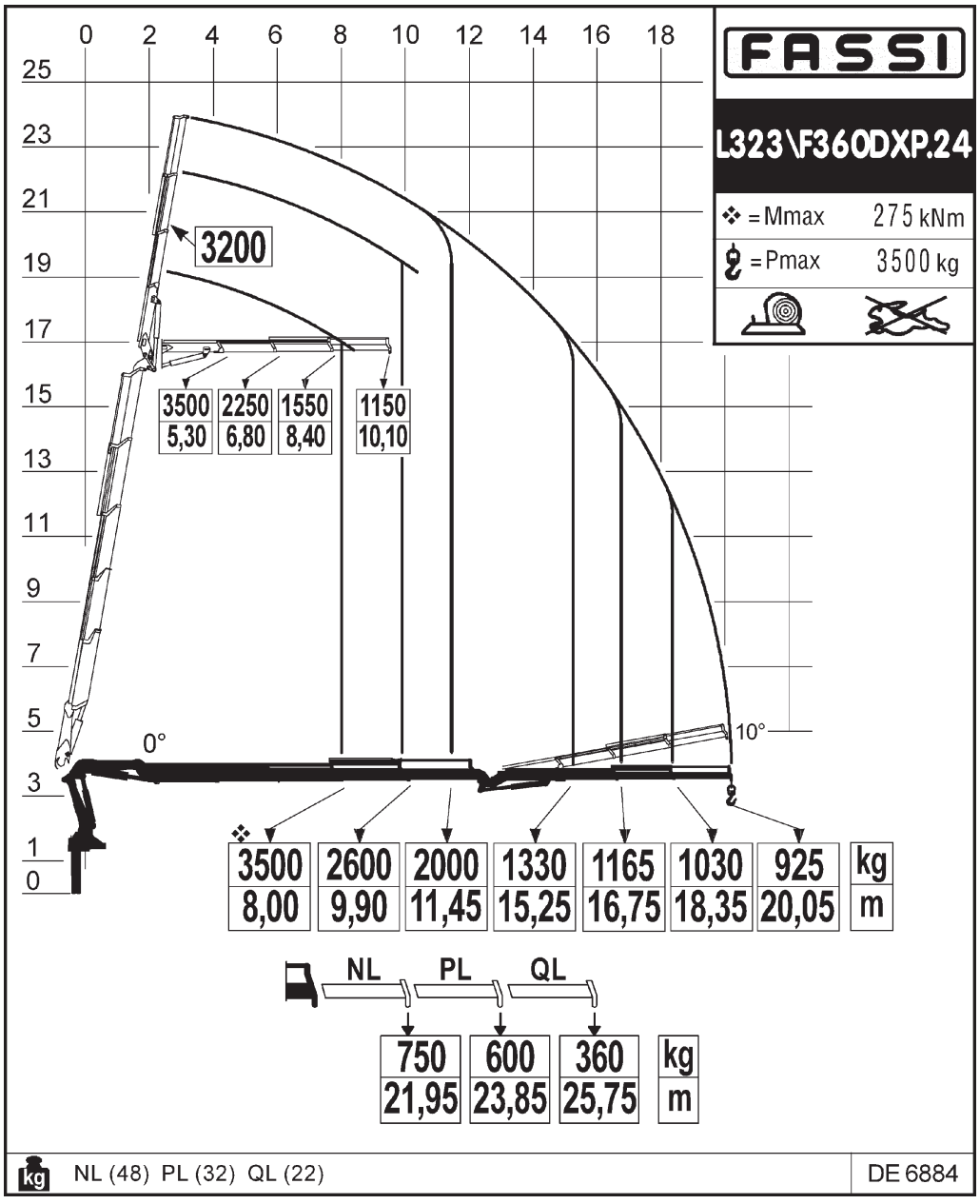

F360DXP.24
=Mmax 322 kNm
=Pmax 11500 kg
=Pmax 9500 kg
=Pmax 1900 kg
FASSI
0°
P
Q
R
11500 9500 7300 5045 3765 2980 2480 1900 1500 1200 kg
2,45 3,20 4,50 6,35 8,30 10,30 12,25 14,55 16,85 19,30 m
P (112) Q (94) R (72)
DE 6985

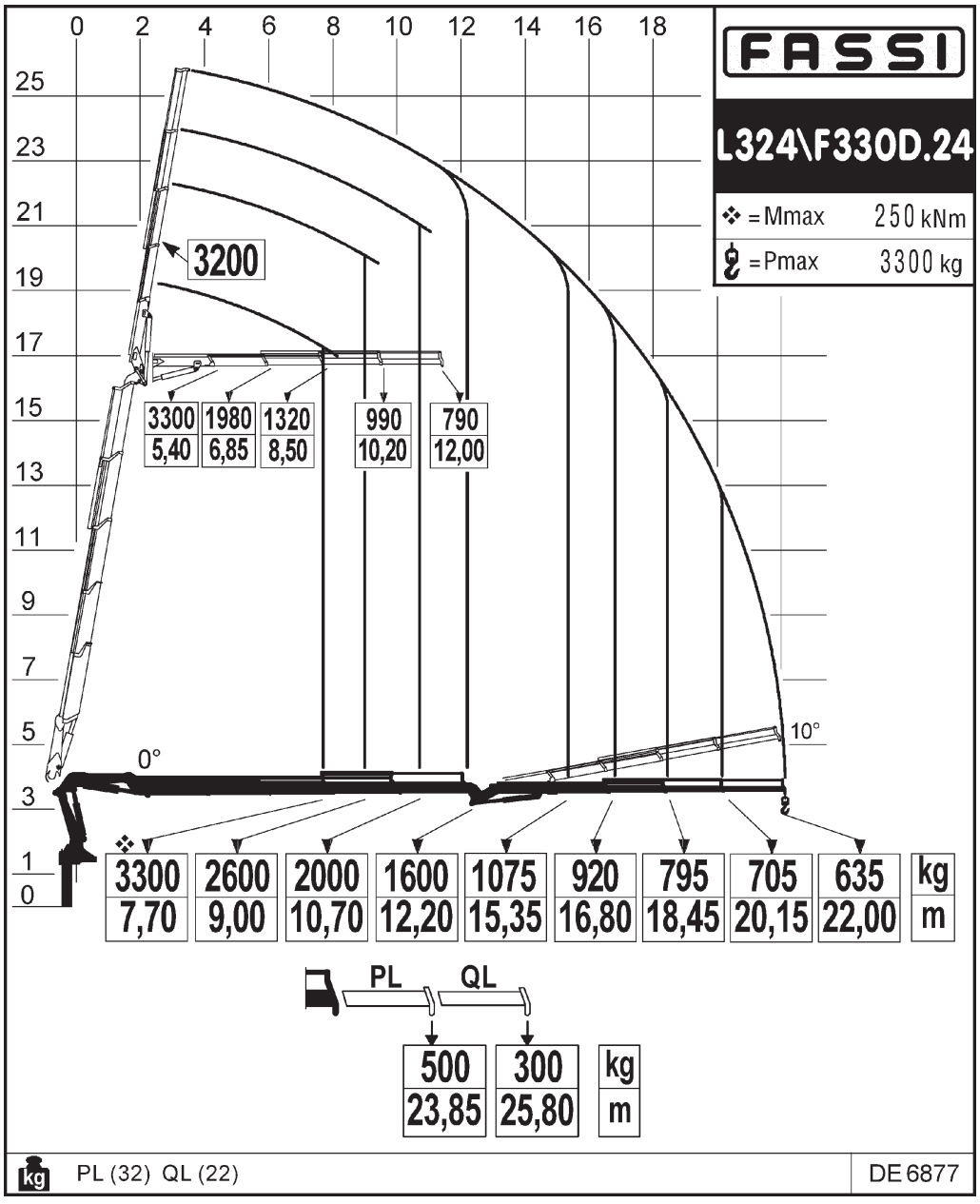

0 2 4 6 8 10 12
17
15
13
11
9
7
5
3
1
0
7000
7800
8000
15°
0°
FASSI
F360DXP.24
=Mmax 322 kNm
=Pmax 11500 kg
=Pmax 9500 kg
=Pmax 1900 kg
11500 9500 7300 5045 3765 2980 2480 kg
2,45 3,20 4,50 6,35 8,30 10,30 12,25 m
P Q R
1900 1500 1200 kg
14,55 16,85 19,30 m
P (112) Q (94) R (72)
DE 6781


FASSI
F330D.24
= Mmax 281 kNm
= Pmax 6000 kg
= Tmax 2000 daN
0 2 4 6 8 10 12
17 15 13 11 9 7 5 3 1 0
6000
4,90
n=3
15°
0°
2,6 m
min.
n=3
n=2
n=2
n=2
4580
6,25
3395
8,15
2660
10,15
2200
12,15
kg
m
P Q R
n=1
n=1
n=1
1750
14,45
1380
16,75
1100
19,20
kg
m
P (112) Q (94) R (72)
V20 (190)
DE 7041


FASSI
F330D.24
= Mmax 277 kNm
= Pmax 6000 kg
= Tmax 3000 daN
0 2 4 6 8 10 12
17 15 13 11 9 7 5 3 1 0
6000
4,95
n=2
15°
3,2 m
min.
n=2 n=2 n=1 n=1
4555 3350 2620 2165 kg
6,20 8,15 10,15 12,15 m
P Q R
n=1 n=1 n=1
1710 1360 1090 kg
14,45 16,75 19,20 m
P (112) Q (94) R (72)
V30 (310)
DE 7023


FASSI
L323\F330D.24
= Mmax 257 kNm
= Pmax 3400 kg
0 2 4 6 8 10 12 14 16 18
25 23 21 19 17 15 13 11 9 7 5 3 1 0
3200
3400 5,30
2080 6,80
1420 8,40
1080 10,10
0°
10°
3400 7,70
2600 9,20
2000 10,50
1150 15,25
1005 16,75
885 18,35
795 20,05
kg
m
NL PL QL
670 21,95
520 23,85
320 25,75
kg
m
NL (48) PL (32) QL (22)
DE 6876


FASSI
L323\F360DXP.24
= Mmax 275 kNm
= Pmax 3500 kg
0 2 4 6 8 10 12 14 16 18
25 23 21 19 17 15 13 11 9 7 5 3 1 0
3200
3500 5,30
2250 6,80
1550 8,40
1150 10,10
0°
10°
3500 8,00
2600 9,90
2000 11,45
1330 15,25
1165 16,75
1030 18,35
925 20,05
kg
m
NL PL QL
750 21,95
600 23,85
360 25,75
kg
m
NL (48) PL (32) QL (22)
DE 6884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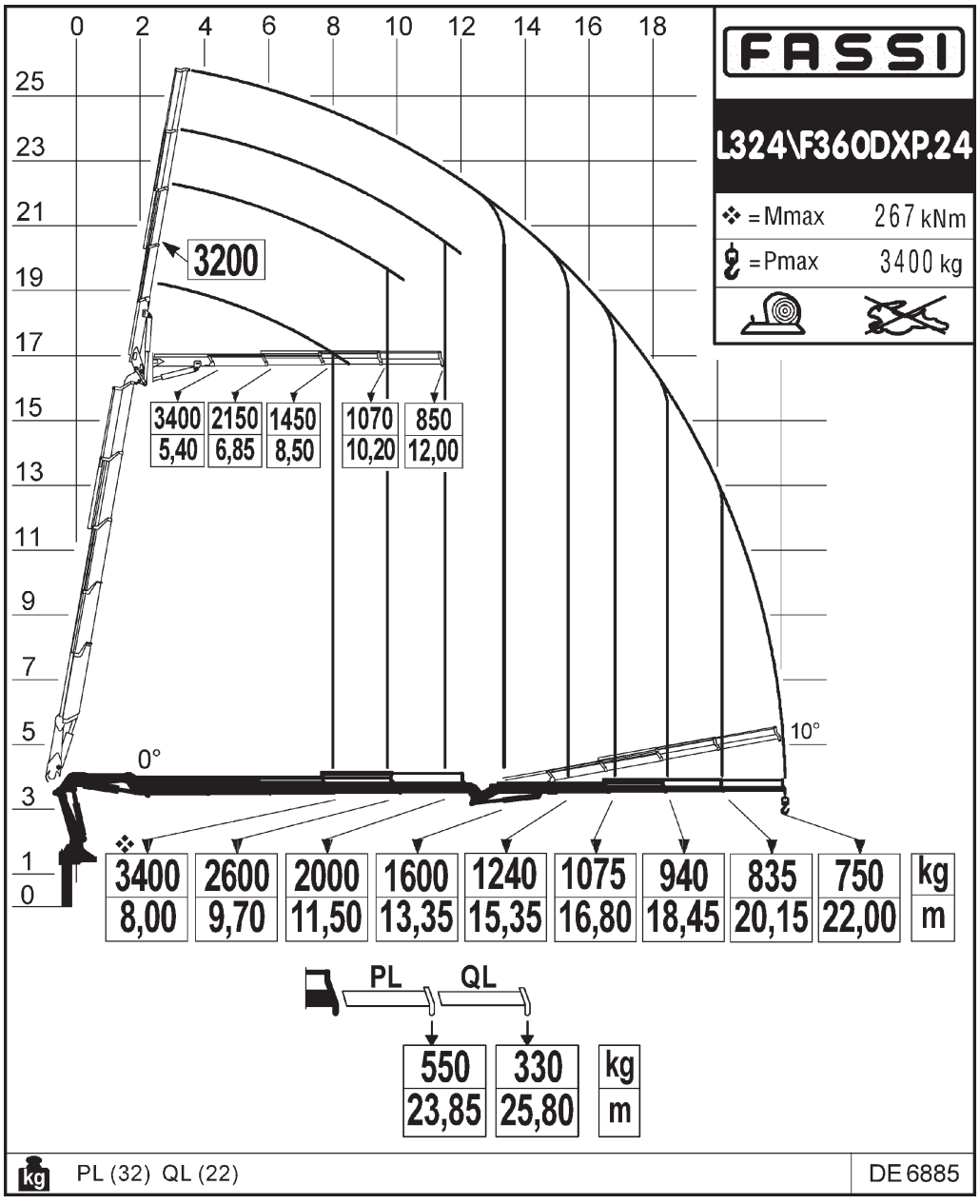
L324\F330D.24
= Mmax 250 kNm
= Pmax 3300 kg
0 2 4 6 8 10 12 14 16 18
25 23 21 19 17 15 13 11 9 7 5 3 1 0
3200
3300 5,40
1980 6,85
1320 8,50
990 10,20
790 12,00
0°
10°
3300 7,70
2600 9,00
2000 10,70
1600 12,20
1075 15,35
920 16,80
795 18,45
705 20,15
635 22,00
kg
m
PL
QL
500 23,85
300 25,80
kg
m
PL (32) QL (22)
DE 6877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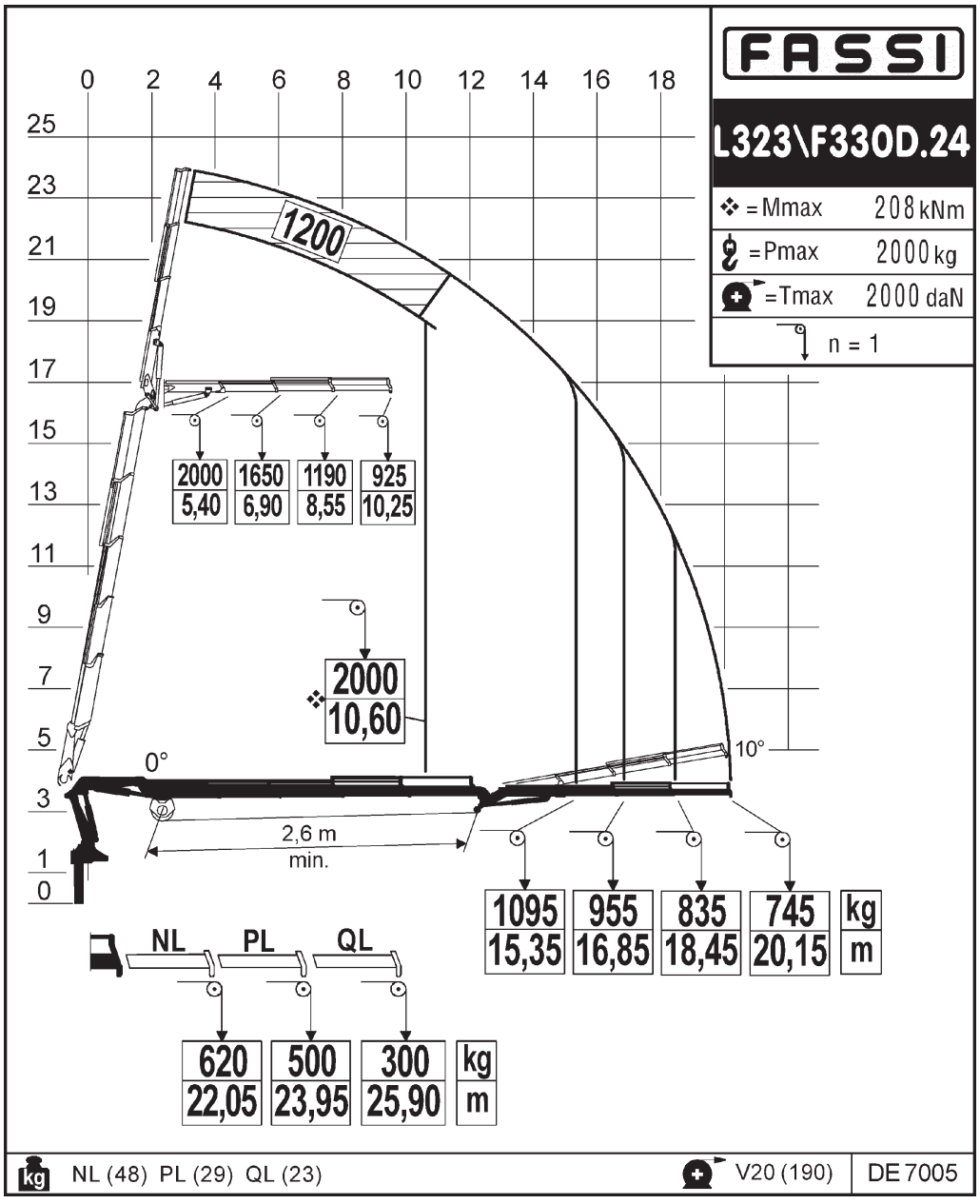
L324\F360DXP.24
= Mmax 267 kNm
= Pmax 3400 kg
0 2 4 6 8 10 12 14 16 18
25 23 21 19 17 15 13 11 9 7 5 3 1 0
3200
3400 5,40
2150 6,85
1450 8,50
1070 10,20
850 12,00
0°
10°
3400 8,00
2600 9,70
2000 11,50
1600 13,35
1240 15,35
1075 16,80
940 18,45
835 20,15
750 22,00
kg
m
PL
QL
550 23,85
330 25,80
kg
m
PL (32) QL (22)
DE 6885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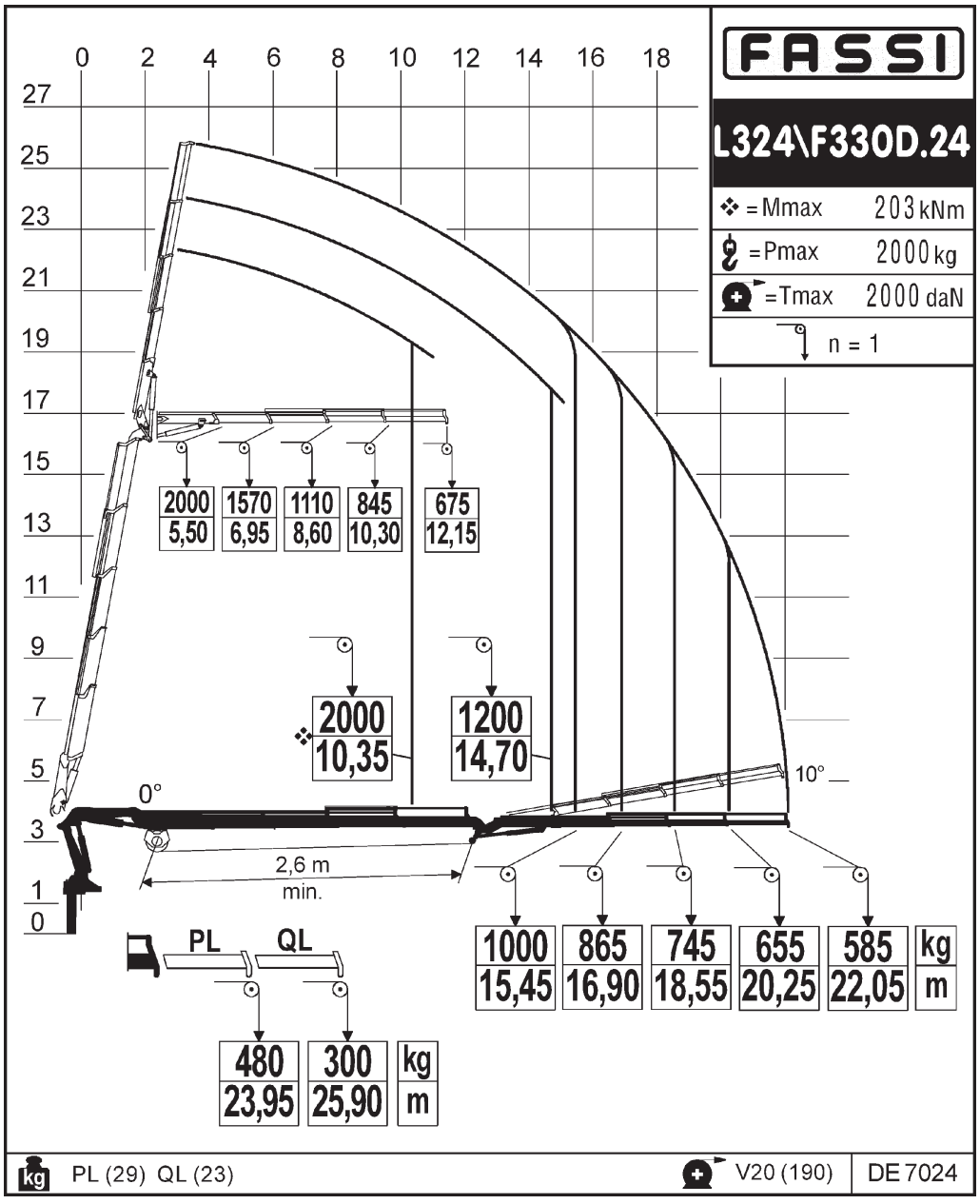
L323\F330D.24
❖ = Mmax 208 kNm
= Pmax 2000 kg
= Tmax 2000 daN
n = 1
0 2 4 6 8 10 12 14 16 18
25 23 21 19 17 15 13 11 9 7 5 3 1 0
1200
2000 5,40
1650 6,90
1190 8,55
925 10,25
2000 10,60
0°
10°
2,6 m min.
1095 15,35
955 16,85
835 18,45
745 20,15
kg m
NL PL QL
620 22,05
500 23,95
300 25,90
kg m
NL (48) PL (29) QL (23)
V20 (190)
DE 7005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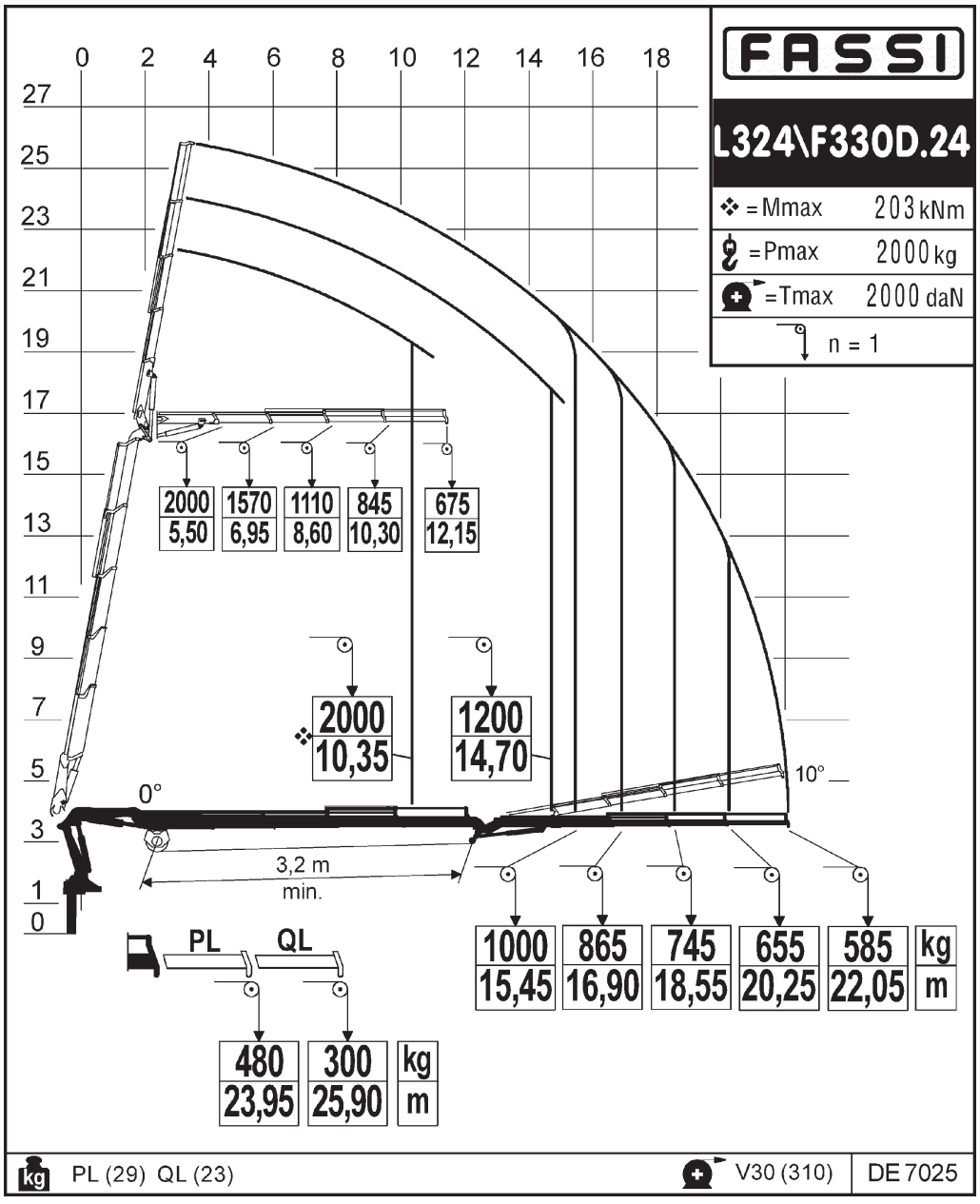
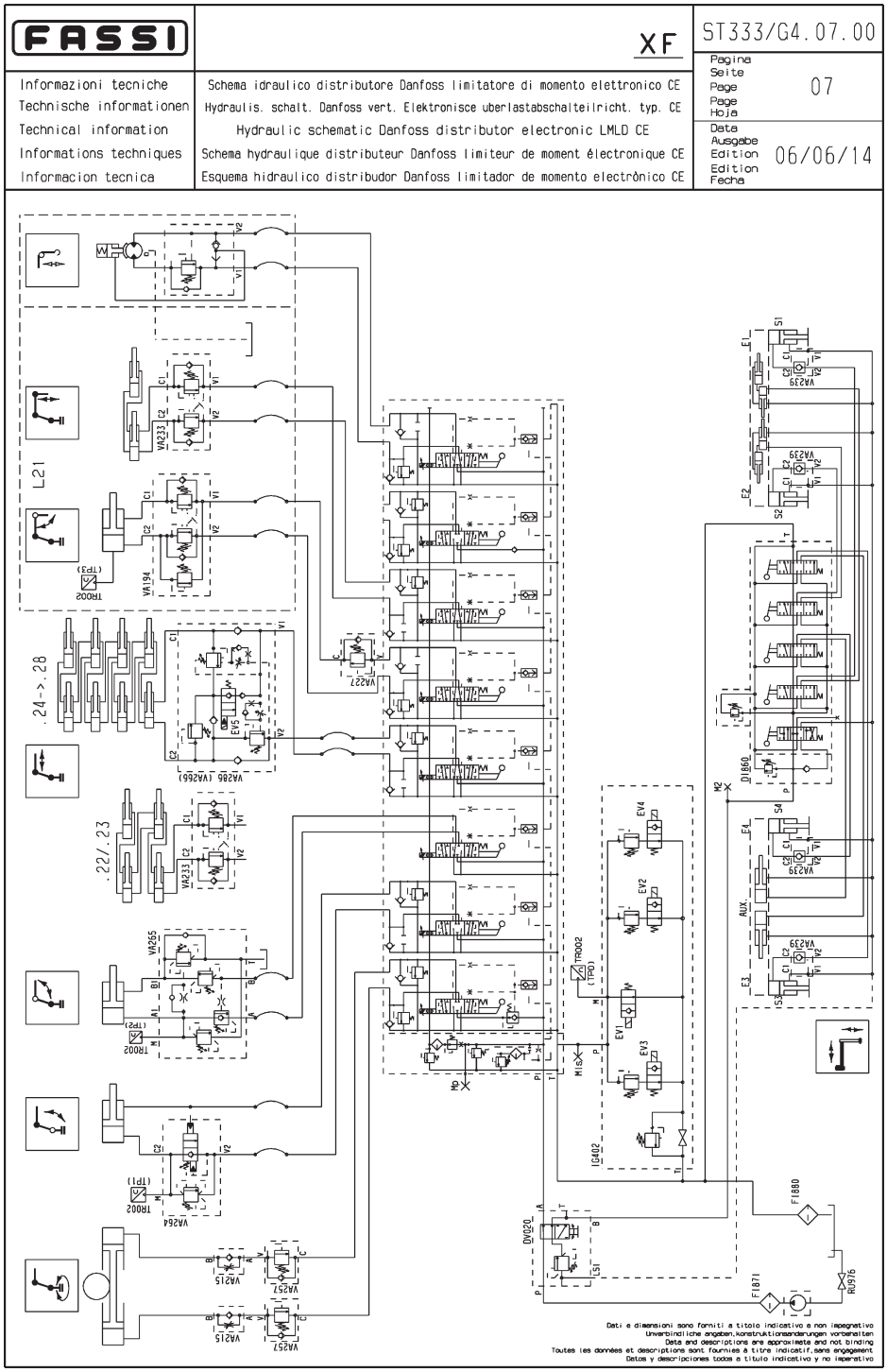
L324\F330D.24
= Mmax 203 kNm
= Pmax 2000 kg
= Tmax 2000 daN
n = 1
0 2 4 6 8 10 12 14 16 18
27 25 23 21 19 17 15 13 11 9 7 5 3 1 0
2000 5,50
1570 6,95
1110 8,60
845 10,30
675 12,15
2000 10,35
1200 14,70
0°
10°
2,6 m min.
PL QL
1000 15,45
865 16,90
745 18,55
655 20,25
585 22,05
kg m
480 23,95
300 25,90
kg m
PL (29) QL (23)
V20 (190)
DE 7024


FASSI
L324\F330D.24
= Mmax 203 kNm
= Pmax 2000 kg
= Tmax 2000 daN
n = 1
0 2 4 6 8 10 12 14 16 18
27 25 23 21 19 17 15 13 11 9 7 5 3 1 0
2000 5,50
1570 6,95
1110 8,60
845 10,30
675 12,15
2000 10,35
1200 14,70
0°
10°
3,2 m min.
PL QL
1000 15,45
865 16,90
745 18,55
655 20,25
585 22,05
kg
m
480 23,95
300 25,90
kg
m
PL (29) QL (23)
V30 (310)
DE 7025

4 HYDRAULIC SCHEMATICS (version with lifting moment limiting device)

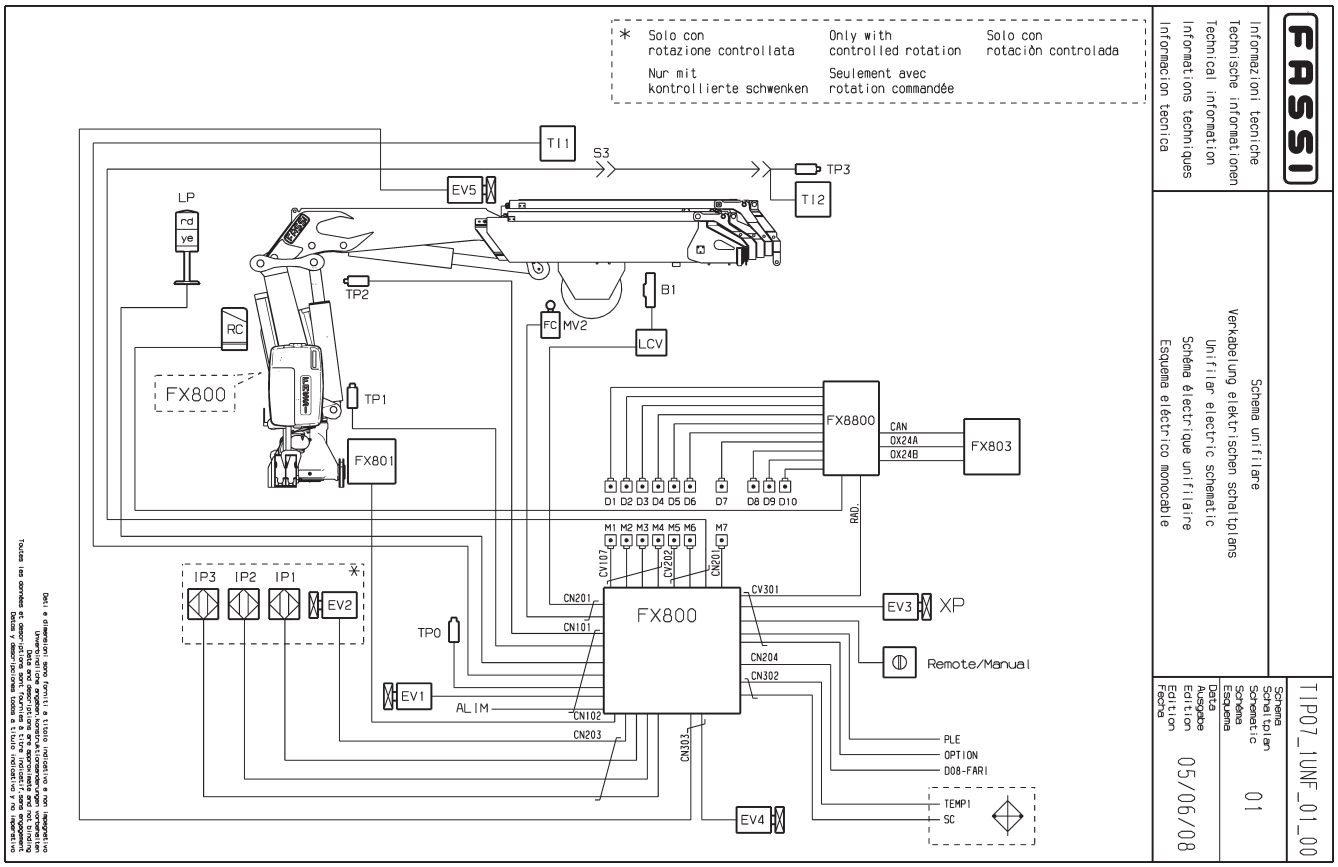
Hydraulic schematic - Danfoss distributor - "electronic" lifting moment limiting device - CE



CODE	*DESCRIPTION*
DI860	DISTRIBUTOR
DV020	DEVIATOR
IG402	INTEGRATED ASSEMBLY OF THE LIMITING DEVICE
FI781	FILTER (HIGH PRESSURE)
FI880	FILTER (RETURN)
M	GAUGE QUICK CONNECTION
RU976	FAUCET
TR002	PRESSURE TRANSDUCER
VA194	DOUBLE EFFECT BLOCK VALVE
VA215	OIL FLOW CHECK VALVE
VA227	SEQUENCE VALVE
VA233	DOUBLE EFFECT BLOCK VALVE
VA239	SIMPLE EFFECT BLOCK VALVE
VA257	SEQUENCE VALVE
VA264	SIMPLE EFFECT BLOCK VALVE
VA265	DOUBLE EFFECT BLOCK VALVE
VA286	REGENERATIVE VALVE

5 ELECTRIC SCHEMATICS

Electric schematic for crane



CODE	*DESCRIPTION*
ALIM	MAINS
B1	LOAD CELL
D08-FARI	ACTIVATION OF DANFOSS FUNCTION NO.8 OR ACTIVATION OF WORKING LIGHTS
D1/.../D10	CONNECTORS FOR DANFOSS MODULES
EV1	ELECTROVALVE FOR CRANE BLOCK
EV2	ELECTROVALVE FOR LIFTING MOMENT LIMITING DEVICE OF THE TWO WORKING ZONE
EV3	XP ELECTROVALVE
EV4	PRESSURE REDUCING ELECTROVALVE FOR EXTENSION BOOMS EXIT
EV5	REGENERATIVE ELECTROVALVE
FX800	MAIN CONTROL UNIT
FX801	CONTROL PANEL
FX803	CONTROL UNIT DANFOSS
FX8800	SHUNT BOX FOR DANFOSS MODULES
IP1/2/3	PROXIMITY MICROSWITCH FOR ROTATION CONTROL
LCV	WINCH LOAD LIMITING DEVICE
LG	YELLOW WARNING LIGHT 90% LOAD
LP	FLASHING LIGHT
LR	BLOCK RED WARNING LIGHT
M1/.../M7	MICROSWITCH ON THE DISTRIBUTOR
MV2	DRUM MICROSWITCH WINCH
OPTION	REMOTE CONTROL OPTIONS
PLE	CABLE FOR PLATFORM
RC	RADIO-REMOTE CONTROL RECEIVER
REMOTE	REMOTE / MANUAL SELECTOR (OPERATION WITH RADIO CONTROL OR MANUALLY)
S3	TRANSDUCER CONNECTOR ON HYDRAULIC JIB
SC	HEAT EXCHANGER
TEMP1	TEMPERATURE TRANSDUCER FOR HEAT EXCHANGER
TI1	INCLINATION TRANSDUCER OUTER BOOM
TI2	INCLINATION TRANSDUCER HYDRAULIC JIB
TP0	PRESSURE TRANSDUCER FOR INNER RAM
TP1	PRESSURE TRANSDUCER FOR DISTRIBUTOR HEAD
TP2	PRESSURE TRANSDUCER FOR OUTER RAM
TP3	PRESSURE TRANSDUCER FOR EXTENSION RAM

6 SAFETY NORMS

Strictly conform to the norms reported by the plates **DE2499B** (fig. 1) or **DE4236** (fig. 1a) placed next to the controls, in order to avoid possible accidents while operating the crane.

Only authorized persons are allowed to operate the crane.

The crane must be used on firm, level ground.

Check that the vehicle hand brake is on and that the wheels are chocked.

Before every operation make sure that:
- no-one is within the working area of the crane;
- the safety devices are in place and operative;
- the minimum safe working distances from power lines are observed;
- the load is correctly slung and hooked.

Stabilize the vehicle by the outrigger rams, making sure that:
- the lateral supports are fully extended;
- the wheels are in contact with the ground and the suspension is not completely unloaded.

Use the crane in accordance with the use and maintenance manual, making sure that:
- the load and radius are within the maximum limits shown on the crane capacity plate;
- the crane is used progressively avoiding sudden load movements
- swinging or dragging of the load is avoided;
- the load is lifted before rotating.

When using implements protect the crane working area with a barrier.

The vehicle/crane are not left unless the power take off is disengaged and the load is on the ground.

Before driving the vehicle make sure that the outriggers are fully retracted and re-entered, the safety taps closed and the crane is in folded position.

VERTICAL VERSION *fig. 1*

FASSI GRU IDRAULICHE

FASSI GRU IDRAULICHE SpA
24021 ALBINO (BG) ITALIA - Via dei Carmelitani, 2
Tel. + 39 35 77.64.00 - Fax + 39 35 75.50.20

DE2499B

INSTRUCTIONS FOR SAFE USE OF THE CRANE

1 Only authorized persons are permitted to operate the crane.

2 The crane must be used on firm, level ground.

3 Check that the vehicle hand brake is on and that the wheels are chocked.

4 Before operation make sure that:
- no-one is within the working area of the crane;
- the safety devices are in place and operative;
- the minimum safe working distances from power lines are observed;
- the load is correctly slung and hooked.

5 Stabilize the vehicle with the outriggers, making sure that:
- the lateral supports are fully extended;
- the wheels are in contact with the ground and the suspension is not completely unloaded.

6 Use the crane in accordance with the use and maintenance manual, making sure that:
- the load and radius are within the maximum limits shown on the crane capacity plate;
- the crane is used progressively avoiding sudden load movements;
- swinging or dragging of the load is avoided;
- the load is lifted before rotating.

7 When using implements protect the working area with a barrier.

8 The vehicle/crane are not left unless the power take off is disengaged and the load is on the ground.

9 Before driving the vehicle ensure that the outriggers are fully retracted and re-entered, the safety taps closed and the crane is in the folded position.

HORIZONTAL VERSION *fig. 1a*

FASSI GRU IDRAULICHE

FASSI GRU IDRAULICHE SpA
24021 ALBINO (BG) ITALIA - Via dei Carmelitani, 2
Tel. + 39 35 77.64.00 - Fax + 39 35 75.50.20

INSTRUCTIONS FOR SAFE USE OF THE CRANE

DE4236

1 Only authorized persons are permitted to operate the crane.

2 The crane must be used on firm, level ground.

3 Check that the vehicle hand brake is on and that the wheels are chocked.

4 Before operation make sure that:
- no-one is within the working area of the crane;
- the safety devices are in place and operative;
- the minimum safe working distances from power lines are observed;
- the load is correctly slung and hooked.

5 Stabilize the vehicle with the outriggers, making sure that:
- the lateral supports are fully extended;
- the wheels are in contact with the ground and the suspension is not completely unloaded.

6 Use the crane in accordance with the use and maintenance manual, making sure that:
- the load and radius are within the maximum limits shown on the crane capacity plate;
- the crane is used progressively avoiding sudden load movements;
- swinging or dragging of the load is avoided;
- the load is lifted before rotating.

7 When using implements protect the working area with a barrier.

8 The vehicle/crane are not left unless the power take off is disengaged and the load is on the ground.

9 Before driving the vehicle ensure that the outriggers are fully retracted and re-entered, the safety taps closed and the crane is in the folded position.

7 WARNING AND INSTRUCTIONS

7.1 Generality

The use of the crane is reserved to authorized personnel, instructed in advance, who has to conform to the safety norms and instructions contained in the use manual supplied with the crane. (See norms ISO 9926-1)

It is absolutely prohibited to walk or stop under a suspended load

It is prohibited for unauthorized persons to be within the working area.

Under no circumstances interfere with the safety and protection devices.

Warning plates, as well as instruction and operation plates must be replaced when no longer readable or missing. See Paragraph 25 Instruction and warning plates.

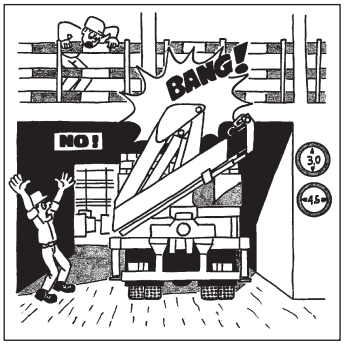
Do not use the outriggers to raise the vehicle.

To avoid hitting bridges or tunnels check and record the overall height of your crane in the folded position or in laid position in the body or on the load. Always respect and pay proper attention to road signs placed in proximity of such obstacles.

7.2 Before operating

(!) ATTENTION (!)

Check that protections are in their place and that all safety devices are fitted and active. (See norms ISO 9927-1)

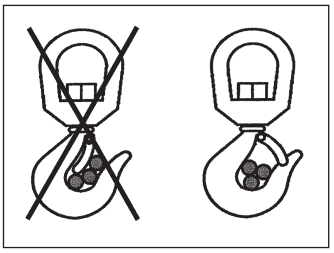


Keep the ladder and the control station on the top seat, clean; Normally, the seat can tilt forward.

Make sure that control stations are properly lit so as to ensure safety while operating and allow instruction plates to be visible.

Check that the working area is adequate and properly lighted for your crane.

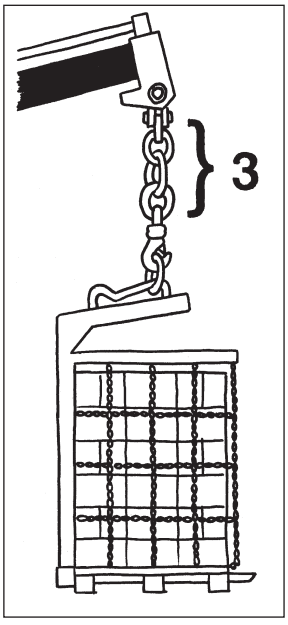
Make sure that the hook is always free to rotate on its pin and that nothing obstructs its vertical positioning.



Check the efficiency of the hook safety catch.

Carefully inspect the condition of ropes or chains. (if present)

Make sure that the pallet fork (if present) is connected to the crane hook by means of a chain having at least **three (3)** rings.



7.3 During operation

Take the vehicle fumes away from the working area by fitting an extension tube of a suitable diameter and a right length to the exhaust system.
Do not run the engine in a indoor area without first making sure there is adequate ventilation.

When using the ladder to reach the control station on the top seat, avoid knocking into the controls while going up or down the ladder.

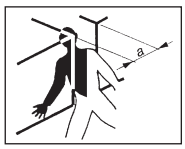
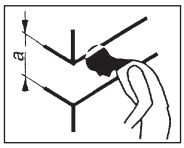
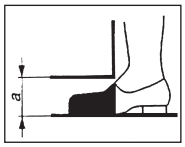
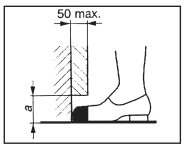
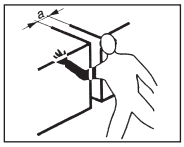
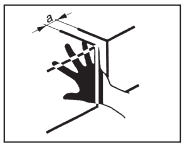
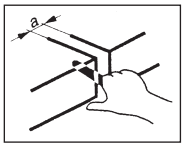
The control station on the top seat is provided with side safety guards; stay within these guards.

Make sure that no one is within the working area of the crane.

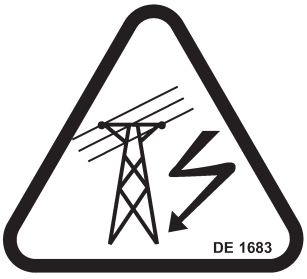
(!) ATTENTION (!)

Avoid swinging the load above working and transit areas; any hidden danger situation must be audibly alarmed.
Avoid all those situations which may result in crushing during vehicle stabilization, crane movement and load handling.

(In conformity with EN 349 standard the minimum safe working distances to avoid crushing parts of the body)

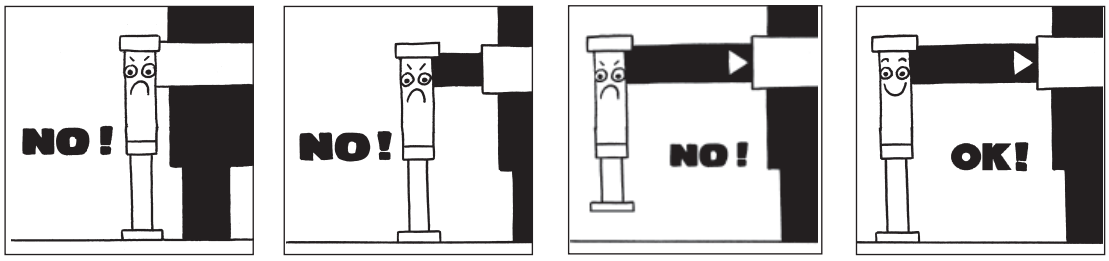
Parts of the Body	Minimum safe working distance mm	Figure	Parts of the Body	Minimum safe working distance mm	Figure
Body	500		Head	300	
Leg	180		Foot	120	
Toes	50		Arm	120	
Hand Wrist Fist	100		Finger	25	

The table indicates the minimum safety working distances concerning the various parts of the body.
The figures illustrate circumstances which may turn out to be dangerous if you fail to respect the minimum safe distances and if it is impossible to introduce larger parts of the body.



(!) ATTENTION (!)

For designated areas as: outrigger running towards rest position, leaning and folding points of the booms in rest position, control platform and swinnig column, top seat and running inner boom, where no carter is possible to be placed, please observe the shear and trapping hazard stickers nearly placed.



(!) ATTENTION (!)

Failure to respect the minimum safe distances may result in a safety hazard and a deadly risk.

Remember that the stability of the unit (crane-vehicle) is only guaranteed by the complete lateral extension of the outriggers and by the observance of the capacity plates.

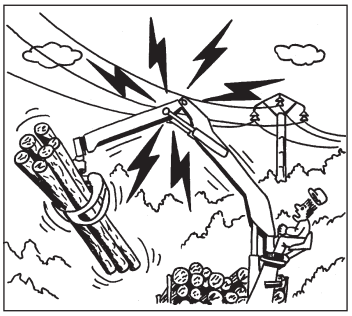
Stabilize the vehicle on a horizontal plane with a maximum tolerance of 1,5 degrees. Make sure that the outrigger rams rest on a solid base, if necessary use larger outrigger base plates (available on request) to avoid sinking. If you adopt other means, make sure that they are suitably sized for the load they must bear.

(!) ATTENTION (!)

Respect the safety distances from electric lines; the minimum distance is, according to CEN norms, five (5) meters, except for otherwise prescribed by national norms.

(!) ATTENTION (!)

Failure to respect the minimum safe distances may result in electrical hazards for the operator and his assistants.



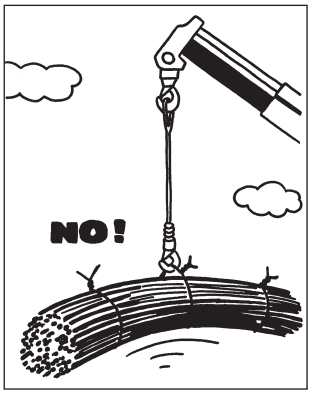
ELECTRICUTION:
General safety precautions for the operator and potential co-workers. If the crane hits an overhead power line, do not touch the crane, the truck or the load.
Carefully evaluate the danger before moving. If you are closer than 10 meters from the crane, the truck, the load or the electric line, move at least 10 meters away, by shuffling away with small steps, in order to minimize the chance of getting a too high voltage difference between the feet.
Warn others to stay away; call for help and contact the power company to de-energize the line: do not attempt to assist someone in direct or indirect contact with the power line before the power has been disabled: you run the risk of being electricuted yourself.
If you are in the truck cabin, stay inside without touching the vehicle body because it's extremely hazardous to go out before the line is de-energised.
Help the electricuted person if you know the first-aid procedures, otherwise wait for the paramedics to arrive.

(!) ATTENTION (!)

Do not utilize the crane during thunderstorms and with wind speed exceeding 13,8 m\s (50 km/h), maximum value of the Beaufort scale degree 6.

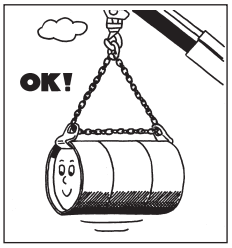
Indications about wind speed

Force of the wind Beaufort scale	Wind speed m/s	Classification	Characteristics
0	0,0 - 0,2	Calm	Calm wind, smoke goes up quite vertically
1 2	0,3 - 1,5 1,6 - 3,3	Light breeze	Smoke reveals the direction of the wind, one can feel the wind blowing, leaves start fluttering.
3 4	3,4 - 5,4 5,5 - 7,9	Moderate breeze	Leaves and branches are in constant motion, small branches start fluttering. Dust and papers dance on the ground.
5	8,0 - 10,7	Fresh breeze	Small green branches bend, the surface of waterways and lakes are wavy.
6	**10,8 - 13,8**	**Near gale**	**Big branches bend, wind whistles through high-tension cables, it's difficult to walk keeping the umbrella open.**
7	13,9 - 17,1	Moderate gale	Trees sway, it's hard to walk
8	17,2 - 20,7	Storm wind	Branches get broken, it's hard to walk.
9	20,8 - 24,4	Storm	It damages houses (antennas and roof tiles fall down)



(!) ATTENTION (!)

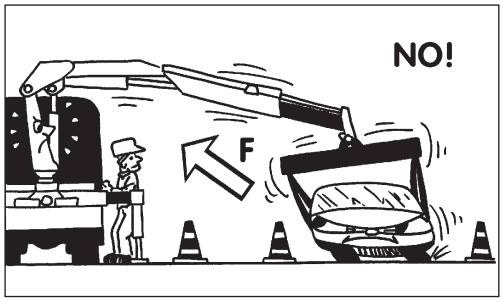
Carefully inspect the load rigging.

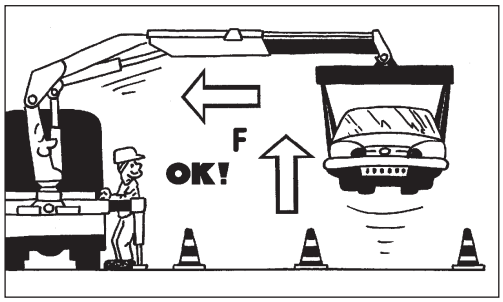


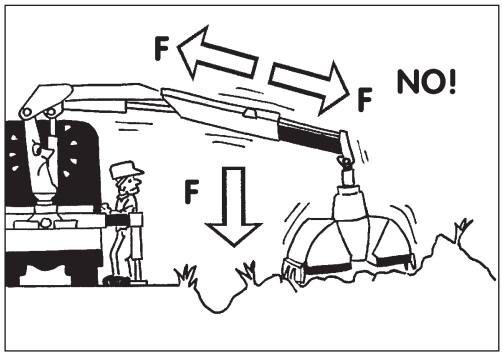
Hook up the load, checking that it does not exceed the capacity indicated on the lifting diagram specific to each load configuration.

Make sure that the lifted load is balanced.

Avoid swinging the load above the control station; in cases where the load is too close, the crane must be operated from the opposite side or with the radio-remote control.
When operating through a winch, lift the load vertically using the cable and not the booms in order to avoid swinging the load.







Do not rotate the crane before the load is lifted.

Do not operate with sudden movements, activate the controls with slow and progressive movements; rotate slowly and with care paying attention to the stability of the vehicle.

With vertical lift, on hydraulic and mechanical extension, rotate slowly in order to avoid side-skidding.

(!) ATTENTION (!)
Do not utilize the crane for pushpull (F), lateral (F) or sideways (F) operations.

(!) ATTENTION (!)
Crushing (F) or push (F) manoeuvres are not permitted.

(!) Never operate the outriggers when the crane is loaded.

(!) ATTENTION (!)
The vehicle\crane must not be left unless the load is on the ground, the booms of the crane (and of the hydraulic jib), are folded and laid on a solid base and the power take-off is disengaged.

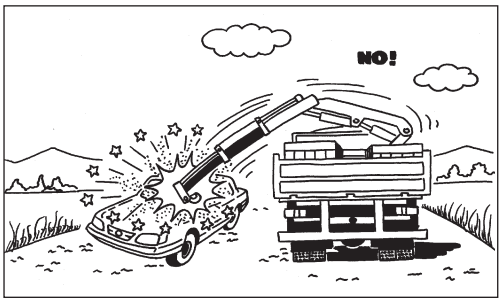
Do not move the vehicle with the crane not in transport position and not with a load suspended on the crane.

7.4 **At the end of the operation** (Prior to driving the vehicle)

Fold the crane.

If the booms of the crane (or of the hydraulic jib) are to be laid on the body or on the load, they must be suitably blocked to prevent possible sideways movements.

Make sure that the indications about the overall dimensions are respected.



NOTE
Implements can be left mounted on the booms of the crane (or of the hydraulic jib) only if the overall dimensions are respected; they must be suitably blocked to prevent possible sideways movements.

If an accessory (fork, ...) is mounted, it must be tied down at all times during transport.
Make sure that the outrigger supports and rams are re-entered within the overall width of the truck and locked by the safety devices.

Disengage the power take off.

7.5 Residual risks

NOTE: This reasoned list does not carry the complete list of the residual risks, which are examined more in detail paragraph by paragraph in the manual under "**(!) ATTENTION (!)**"; it is instead a way to exemplify to the operator the types of hazards linked to the use of the crane, which basically involves a lifted load in movement. Therefore we confirm you the following

It is absolutely forbidden to use the crane without having read and understood the manual for use and maintenance and without having being previously instructed by experienced personnel on all aspects of safe crane operation.

Risk evaluation shall be followed by adequate provisions in order to avoid risks and damages to people and things.

The crane operator shall be held directly responsible for the correct operation of the crane also according to the jobsite conditions.

Overturn: the crane can overturn, thus hurting people and damaging things specially in following conditions:
- if it is not correctly stabilized
- if the moment limiting device is disabled
- if the ground conditions at the jobsite are not stable enough with respect to the dimensions of the outrigger base and/or of the additional base plate
- if you increase the design dynamic increasing the pump oil flow.

Moment limiting device: never try to bypass nor tamper with the moment limiting device and the various safety systems installed on the crane. In such case the operator shall be held responsible for the subsequent crane performance. It is also important to understand the alarm messages generated by the "moment limiting device" and act consequently.

Control seat: before operating from the control seat the operator shall make sure that he's safe from hazards (i.e. he stands clear of the load, there is a way of escape,..). Otherwise he shall manoeuvre from a different control seat; if there is none available, the crane should be equipped with a radio control or remote control in order to allow the operator to operate the crane in absolute safety.

From the control seat the operator shall be able to visually inspect the whole working area at all times. If it is not possible he shall team up with a co-worker able to control the whole area; otherwise the crane shall be equipped with a radio control in order to ensure the operator with the perfect position to see all potential hazards clearly at all times. Naturally the operator shall also teach this eventually co-worker with the scope of not harm each other with control commands.

Load rigging: carefully inspect the load rigging; the operator shall make sure that the load is properly attached and balanced and that all unexpected movements are not allowed. Be careful not to hit any potential impediments during the crane movements.

Jobsite conditions: prior to use always ascertain that the working area is free and clear of potential obstacles to crane operations (people, building walls, balconies, eaves, scaffoldings, tree branches, other lifting means or machines, electric lines,…). This may hurt people, damage both the impediments and the crane, and provoke also the crane overturn.

Make sure that there is no risk of elements falling on the operator or on the crane and take the right precautions to prevent it.

Overload and/or fatigue: the crane can break down due to fatigue or overload:
- If it is misused (with cycles, loads or pump oil flow not pertinent to the crane class)
- If it is used for improper tasks (side, oblique or reversal pull)
- If it is used in poor jobsites (corrosive environment, too high or too low temperature, foundry,… [see conditions of use])
- If the load exceeds the rated capacity indicated on the relevant plates

Wrong manoeuvring: the crane can fall break or overturn if the operator performs a wrong manoeuvre due to the lack of familiarity with the operation procedures (see manual of use and maintenance) or due to inadequate psychophysical conditions: we remind you that the directives in force impose a suitable training of the personnel before using these types of machines and require an adequate psychophysical condition to operate safely a lifting device that always implies the intrinsic danger of a lifted load.

Weather conditions: too high or too low temperatures may damage the components of the oleodynamic and electric circuits (See max and min conditions of use); it is forbidden to operate the crane during a storm with lightning hazards, so we recommend to fold it and put it to rest. Furthermore when the wind is too strong the crane can overturn or break down.

Shearing, entrapment: the crane has a lot of parts in movement that it is impossible to cover; therefore the operator shall always be aware of this residual risk and keep clear from the parts in movement, particularly from the load; the operator is held responsible not only for himself but also for those working in proximity of the crane and for those who may draw closer even if not authorized.

Electricution: the crane is not insulated from electric contacts and therefore it is not equipped to work under tension, even if the contact is accidental. Therefore be compliant with the min clearance prescribed by the national directives in force. Generally speaking the clearance from electric lines with a max tension of 38.000 volts should be at least 5 meters: Higher tensions require higher clearance to be verified case by case together with competent technicians and with respect to the environment conditions.

Manual extension overload: manual extensions are controlled by the moment limiting device only under the conditions described in the relative chapter; the control system of the manual extension overload must be activated by the operator as described.

Accessories: be careful when assembling and disassembling the accessories (extensions, buckets, baskets,…); first verify the weight, the securing systems and the instructions for assembly and dismantlement; then appraise their barycentre and provide for adequate provisional blocking systems in order to avoid sudden movements.

(!) ATTENTION (!)

IF IN THE FOLDING CONDITION THE HOOK IS OUT OF TRUCK SIZE, IT MUST BE TAKEN AWAY BEFORE TRAVELLING.

Breakdown of some sensors

The system **"moment limiting device - intelligent type"** is always monitored during ignition (the system, after having activated the various circuits, checks the presence of all the inputs for around 4 seconds) and then continuously monitors the operation and the efficiency of the limiting device (approx. every 25 milliseconds).

For most of the components the system checks also the congruence of the incoming signal with the one the system expects.

Maintenance: maintenance is particularly important; the lack of it may damage things or hurt people.

Particular operations: if you are required to operate under particular conditions not illustrated in the manual of use and maintenance, analyse carefully the situation and always refer to an authorised Fassi shop or to the Fassi technical support service or to experienced operators before starting working.

8 IDENTIFICATION OF THE CRANE MODEL

8.1 Generality

The exact **crane model, serial number** and description of **implements** will enable **FASSI Service Department** to give a rapid and efficient response.

8.2 Crane mark

The **CE** indicates that the crane complies with the Machines Directive (D.M.) 98/37; it can be considered effective only with a written declaration of conformity enclosed. The crane affixed with the **CE** mark is supplied with a lifting moment limiting device to preserve the crane structure from overloads.

Identification data are marked on the plate **DE5891** used for the **CE** mark (fig. 2) and rivetted on the base with personalized rivets **FASSI**.

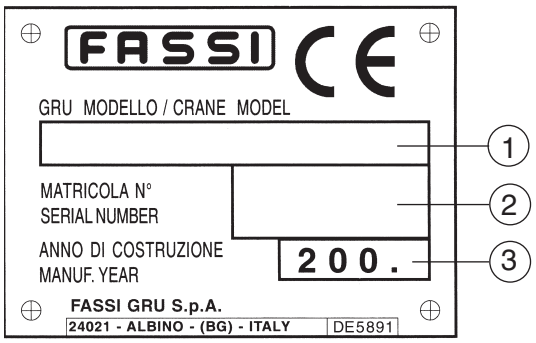


fig. 2

1 - Crane model
2 - Serial Number
3 - Year of manufacturing

The crane must not be put into service within the European Community unless the machine on which it is mounted also conforms with the prescribed Directive. Ever change of use, modification or addition of accessories, not specified by this manual must be affixed with a new **CE** mark in accordance with the Machinery Directive.

A further metallic plate (fig. 3) fixed to the crane by the installer, quotes the identifying data of the equipment and the final **CE** mark.

1 - Name of the installer who applied the final **CE** mark
2 - Crane mark, model and serial number
3 - Vehicle mark, model and chassis number
4 - Year of mounting

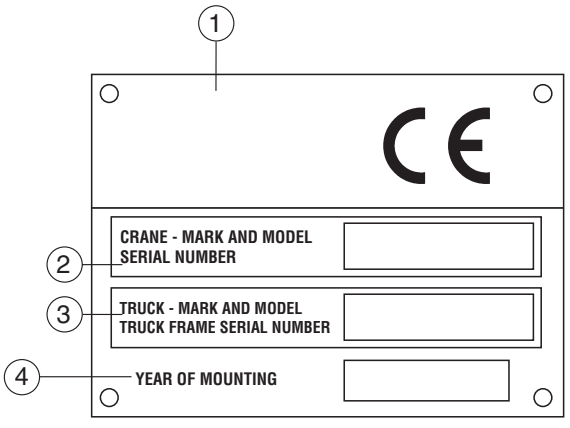
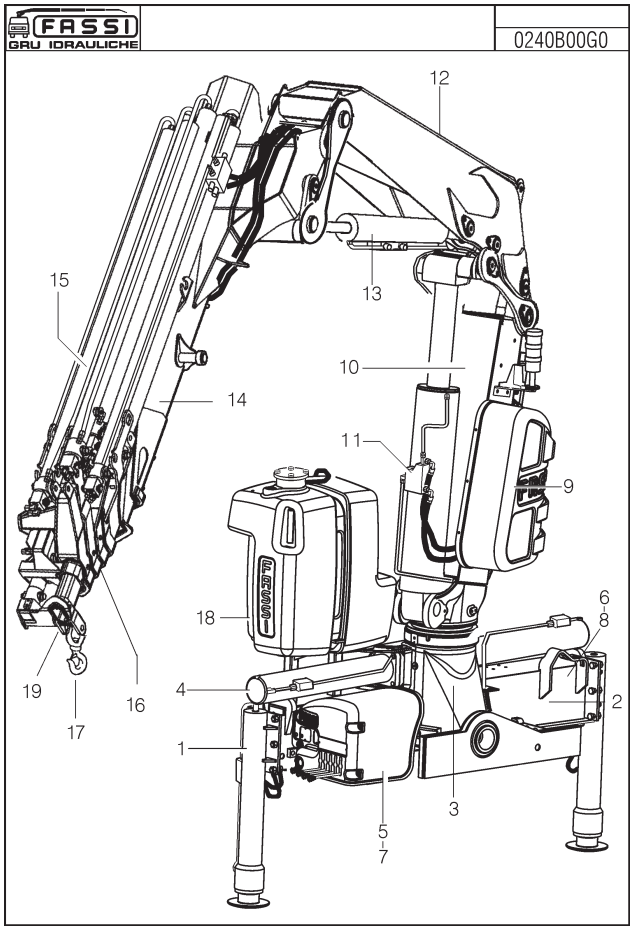


fig. 3

(!) UNDER NO CIRCUMSTANCES SHOULD THE DATA MARKED ON THE PLATES BE ALTERED.

9 CRANE NOMENCLATURE

9.1 Crane with distributor on the column



Pos.	Description
1.	Outrigger rams
2.	Outrigger supports
3.	Base
4.	Rotation cylinders
5.	Deviator crane-outriggers
6.	Dual control for deviator crane-outriggers
7.	Outrigger distributor
8.	Outrigger double control
9.	Distributor bank
10.	Column
11.	Inner ram
12.	Inner boom
13.	Outer ram
14.	Outer boom
15.	Booms extension rams
16.	Extension boom sections
17.	Lifting hook
18.	Oil tank
19.	Manual extensions (optional)

9.2 Crane with ground controls on both sides. Crane with ground controls on both sides and with top seat controls by hand cables (on request)(fig. 4).

Pos.	Description
1.	Outrigger rams
2.	Outrigger supports
3.	Base
4.	Rotation cylinders
5.	Deviator crane-outriggers
6.	Dual control for deviator crane-outriggers
7.	Outrigger distributor
8.	Outrigger double control
9.	Distributor bank
10.	Double control
11.	Column
12.	Inner ram
13.	Inner boom
14.	Outer ram
15.	Outer boom
16.	Booms extension rams
17.	Extension boom sections
18.	Lifting hook
19.	Oil tank
20.	Manual extensions (optional)
21.	Seat (optional)
22.	Hand-cables for crane (optional)

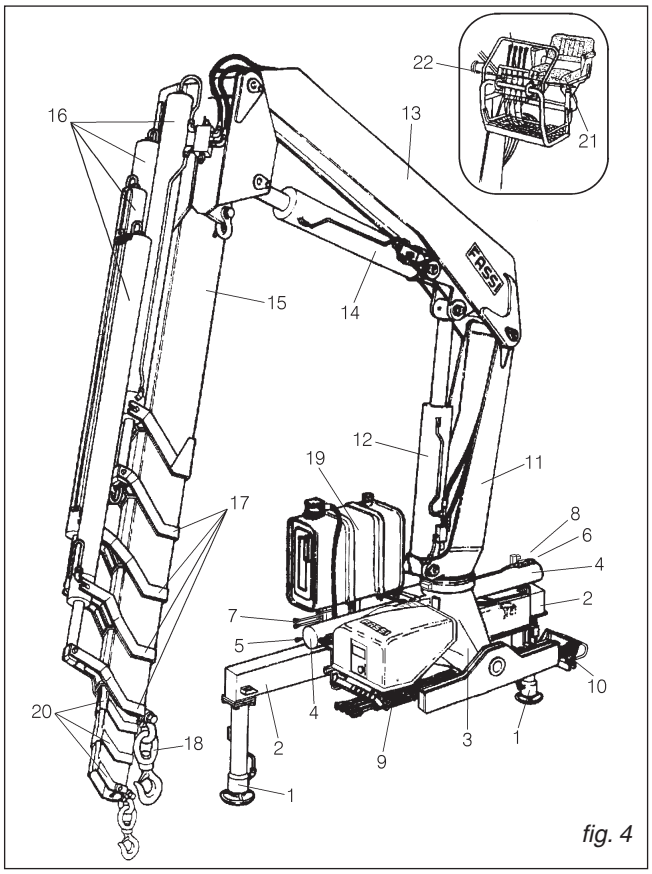


fig. 4

9.3 Crane with top seat controls and with ground controls for outriggers. (fig. 5)

Pos.	Description
1.	Outrigger rams
2.	Outrigger supports
3.	Base
4.	Rotation cylinders
5.	Deviator crane-outriggers
6.	Dual control for deviator crane-outriggers
7.	Outrigger distributor
8.	Outrigger double control
9.	Column
10.	Seat
11.	Distributor bank
12.	Inner ram
13.	Inner boom
14.	Outer ram
15.	Outer boom
16.	Booms extension rams
17.	Extension boom sections
18.	Lifting hook
19.	Oil tank
20.	Manual extensions (optional)

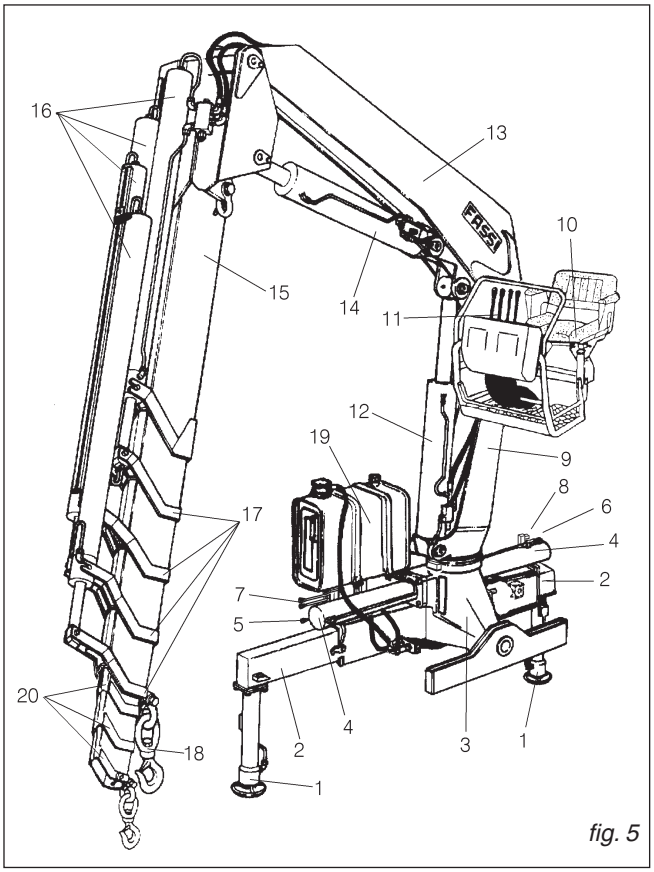
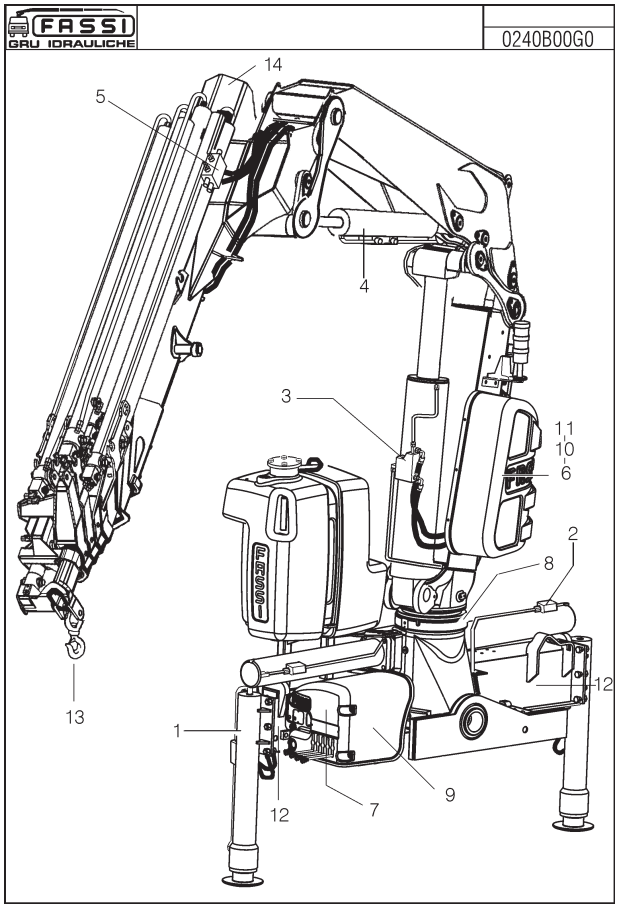


fig. 5

10 NOMENCLATURE OF THE SAFETY AND PROTECTION DEVICES

10.1 Crane with distributor on the column



Pos. Description

1. Check valves for outrigger rams
2. Check valves for rotation control (flow regulators)
3. Check valve for inner ram
4. Check valve for outer ram
5. Check valve for booms extension rams
6. Lifting moment limiting device assembly
7. Control panels
8. Rotation limiting device
9. Main pressure valve (outriggers)
10. Main pressure valve (crane)
11. Auxiliary valves (crane)
12. Safety device for outriggers supports
13. Hook safety device
14. Safety device for extension booms (only for the crane version “C”)

Before crane use check that safety and protection devices are fitted and active.

Under no circumstances interfere with the safety and protection devices.

Interference with the check valves and removal of the lead seal remove the Manufacturer and invalidate the warranty.

Use the ladder for the access to the top seat.

10.2 Crane with ground controls on both sides. Crane with ground controls on both sides and with top seat controls by hand cables (on request)(fig. 6).

Pos. Description

1. Check valves for outrigger rams
2. Check valves for rotation control (flow regulators)
3. Check valve for inner ram
4. Check valve for outer ram
5. Check valve for booms extension rams
6. Lifting moment limiting device assembly
7. Control panels
8. Rotation limiting device
9. Main pressure valve (outriggers)
10. Main pressure valve (crane)
11. Auxiliary valves (crane)
12. Levers guard
13. Safety device for outriggers supports
14. Hook safety device
15. Safety device for extension booms (only for the crane version “C”)

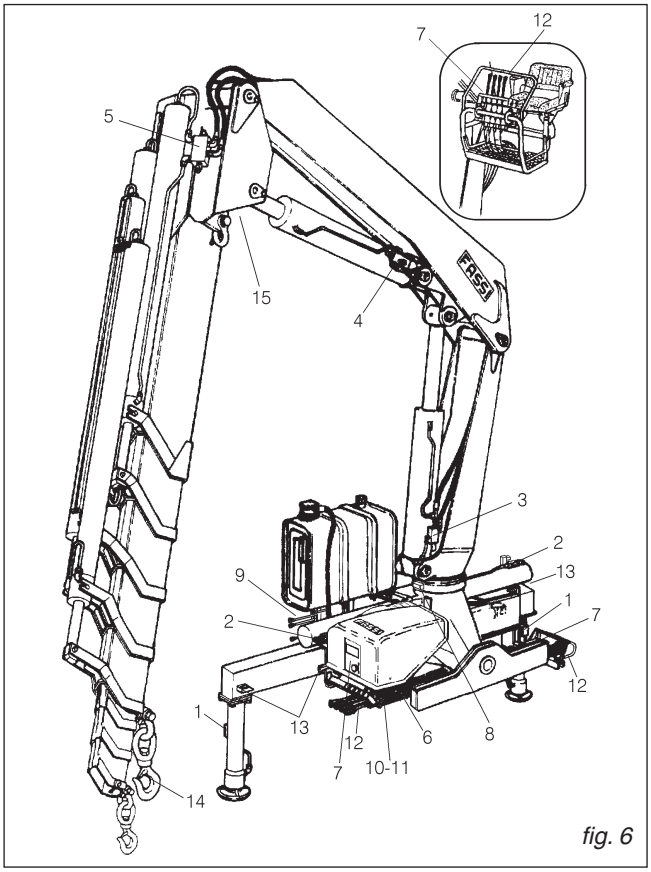


fig. 6

10.3 Crane with top seat controls and with ground controls for outriggers. (fig. 7)

Pos. Description

1. Check valves for outrigger rams
2. Check valve for rotation control
3. Check valve for inner ram
4. Check valve for outer ram
5. Check valve for booms extension rams
6. Lifting moment limiting device assembly
7. Control panel
8. Rotation limiting device
9. Main pressure valve (outriggers)
10. Main pressure valve (crane)
11. Auxiliary valves (crane)
12. Levers guard
13. Safety device for outriggers supports
14. Hook safety device
15. Safety device for extension booms (only for the crane version “C”)

Before crane use check that safety and protection devices are fitted and active.

Under no circumstances interfere with the safety and protection devices.

Interference with the check valves and removal of the lead seal remove the Manufacturer and invalidate the warranty.

Use the ladder for the access to the top seat.

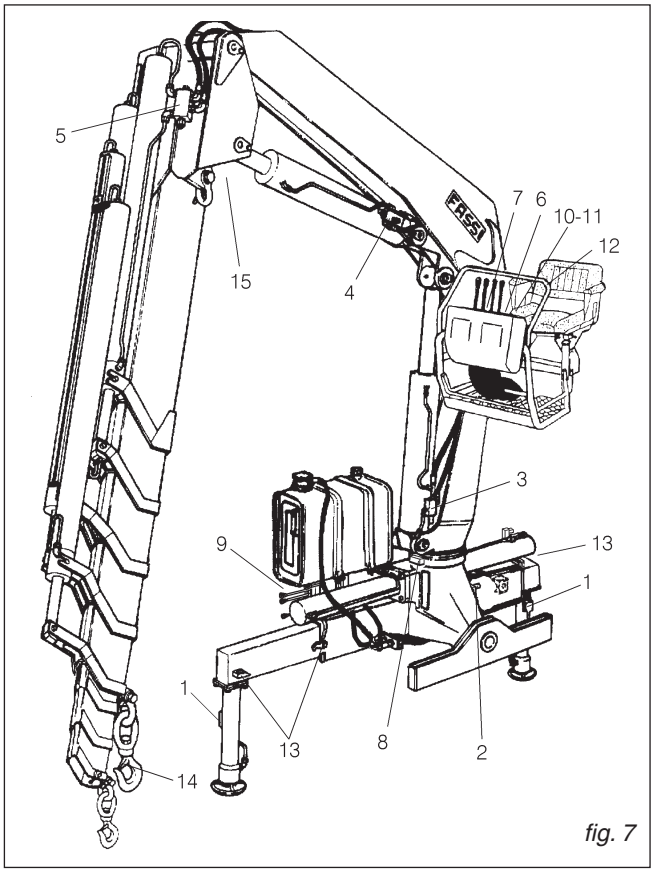


fig. 7

11 SUPPLEMENTARY BEAMS

11.1 Generality

Supplementary beams are used in conjunction with the crane outriggers to ensure the vehicle stability during load handling.

Code	outrigger ram stroke mm	outrigger interaxis mm	extension type	Weight kg
210803ME	455(C)/560(L)	3100	manually-“H” variable	130
210802ME	455(C)/560(L)	3600	manually-“H” variable	162
290800HE	340(C)/550(L)	4100	Hydraulic-“H” variable	320
540800HE	330(C)/510(L)	5000	Hydraulic-“H” variable	550

11.2 Identification of the supplementary beams

Identification data of the supplementary beam is stamped on the plate DE6839 (fig. 8).

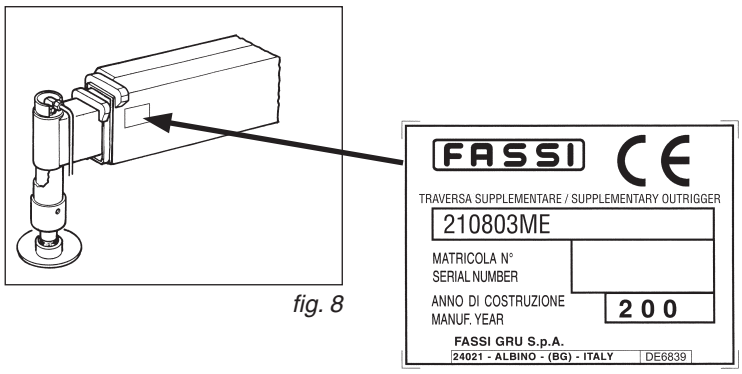


fig. 8

DE6839

13 MANOEUVRES AND CONTROLS TO STABILIZE THE VEHICLE

13.1 Generality

The outriggers rams prevent damaging stresses both to the frame and to the vehicle suspensions on which the crane is mounted to and assure the stability of the unit during load handling.

DE 6409A

(!) ATTENTION (!)

Be very careful when stabilizing the vehicle; make sure that no one is or transits in close proximity of the working area of the outriggers.

(!) ATTENTION (!)

The crane stability is maintained by the maximum extension of the outrigger supports, by the solidity of the base underneath the plates of the outrigger rams and by the observance of the capacity plates. To check the maximum working pressure see Paragraph 2.3 Technical data

Check that the outrigger rams are applied on a solid base; if necessary use larger outrigger base plates (available on request) to avoid sinking.

When stabilization is complete the wheels of the vehicle must still be in contact with the ground and the suspensions must not be fully unloaded.

Stabilize the crane so as to operate on a horizontal plane with a maximum tolerance of 1,5 degrees.

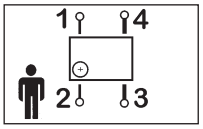
While loading, it may be necessary to vertically adjust the outrigger rams to prevent an overload on the outriggers, then stabilize again.

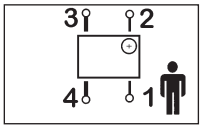
While unloading, the outrigger rams may not be perfectly in contact with the ground because of a rise in the suspension; it is therefore recommended to stabilize the vehicle during operation to avoid an overturn.

13.2 Functions of control levers for stabilization with horizontal distributor

The controls to stabilize the vehicle are activated only from ground level and on both sides of the crane base.

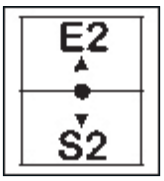
NOTE
The graphic symbols illustrated hereunder are marked on the plates (DE6251-DE6252-DE4496-DE4489) affixed next to the control stations and indicate with the following symbolism.





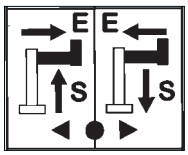
They indicate the position of the operator in relation to the vehicle and the crane.

Lever **CD** for selecting outrigger ram or outrigger support



Levers **D** Deviator -E/S

Lever **C** to control outrigger support or outrigger ram



See Paragraph 25 Instruction and warning plates.

Lever function D - CD - C

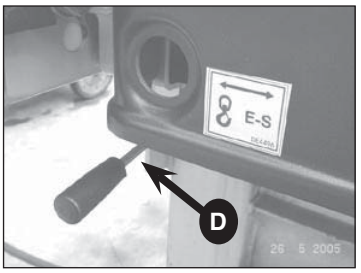
Levers **D** Control for deviator crane-outriggers (- **E\S**). (fig. 1a)

Levers **CD** Control for selecting the supports or the outrigger rams. (fig. 1b)

Levers **C** Control for the support or the outrigger ram selected (fig. 1b)

The "multifunction" control group adopted allows to select and manoeuvre the outrigger support or the ram, through simultaneous operation of the selecting lever **CD** and the control lever **C**.

fig. 1a



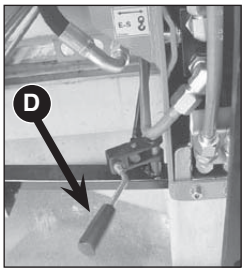
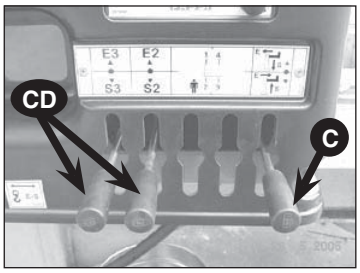
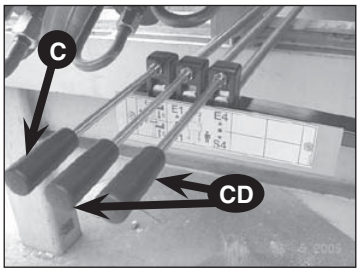


fig. 1b





Exemple
To select the support **E2** or the outrigger ram **S2**
- Position the lever **CD** (corresponding to outrigger support **E2** and to outrigger ram **S2**) on **E2** or **S2** and keep it in position.

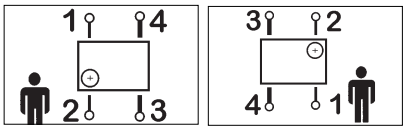
To carry out the operation
- Operate lever **C** to activate the exit/re-entry of outrigger support **E2** or the descent/lift of outrigger ram **S2**

13.2.1 Functions of control levers for stabilization with vertical distributor

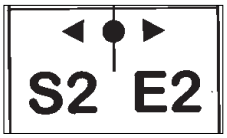
The controls to stabilize the vehicle are activated only from ground level and on both sides of the crane base.

NOTE
The graphic symbols illustrated hereunder are marked on the plates (DE4486-DE4487-DE4488) affixed next to the control stations and indicate with the following symbolism.

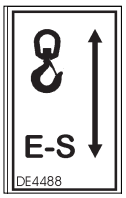
They indicate the position of the operator in relation to the vehicle and the crane.



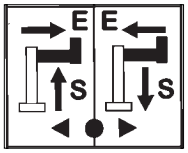
Lever **CD** for selecting outrigger ram or outrigger support



Levers **D** Deviator -E/S



Lever **C** to control outrigger support or outrigger ram



See Paragraph 25 Instruction and warning plates.

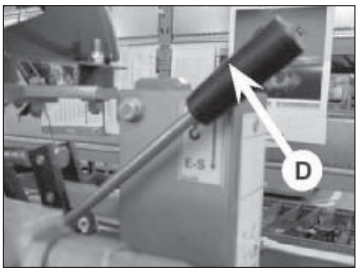
Lever function D - CD - C

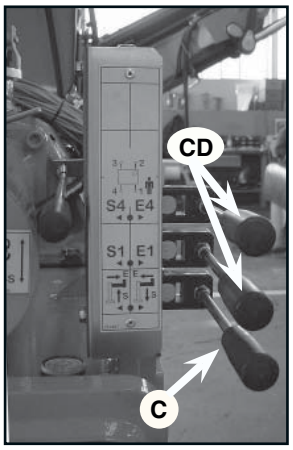
Levers **D** Control for deviator crane-outriggers (- **E\S**). (fig. 2a)

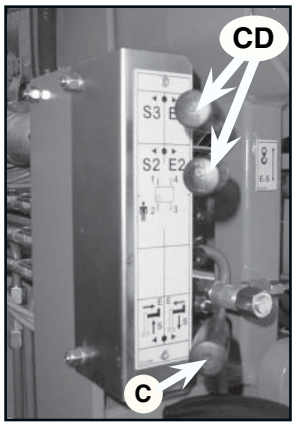
Levers **CD** Control for selecting the supports or the outrigger rams. (fig. 2b)

Levers **C** Control for the support or the outrigger ram selected (fig. 2b)

fig. 2a -2b







The "multifunction" control group adopted allows to select and manoeuvre the outrigger support or the ram, through simultaneous operation of the selecting lever **CD** and the control lever **C**.

Exemple
To select the support **E2** or the outrigger ram **S2**
- Position the lever **CD** (corresponding to outrigger support **E2** and to outrigger ram **S2**) on **E2** or **S2** and keep it in position.

To carry out the operation
- Operate lever **C** to activate the exit/re-entry of outrigger support **E2** or the descent/lift of outrigger ram **S2**

13.3 Controls to stabilize the vehicle

The controls conform with the safety directives and enable the operator to activate the lateral extension of the outrigger supports and rams only from the side where he can visually check the operation.

Controls for positioning the outriggers of the crane and the supplementary beam.

Disengage the locking devices of the outrigger supports by putting the levers **A** from the position of the fig. 3 to the one of the fig. 4.

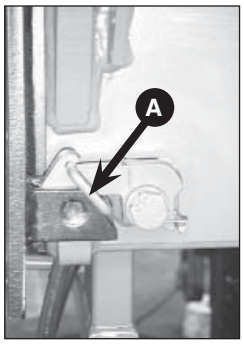


fig. 3

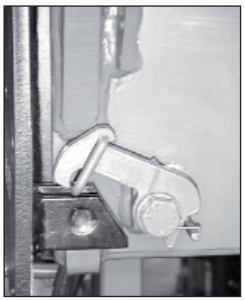
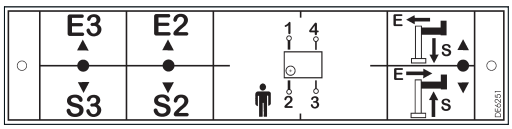


fig. 4

Controls workable from the distributor side of the crane fig. 5 and fig. 5a

horizontal distributor *fig. 5*



vertical distributor

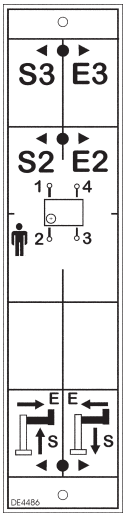


fig. 5a

Position lever **D** of oil-diverter (-**E/S**) on **E/S**.

How to exit the outrigger support **E2** (crane)
- Operate the corresponding lever **CD** towards "**E2**" and keep it in position.
- Operate the lever **C** to exit the outrigger support.

How to descent the outrigger ram **S2** (crane)
- Operate the corresponding lever **CD** towards "**S2**" and keep it in position.
- Operate the lever **C** to descent the outrigger ram.

How to exit the outrigger support **E3** (supplementary outriggers)
- Operate the corresponding lever **CD** towards "**E3**" and keep it in position.
- Operate the lever **C** to exit the outrigger support.

How to descent the outrigger ram **S3** (supplementary outriggers)
- Operate the corresponding lever **CD** towards "**S3**" and keep it in position.
- Operate the lever **C** to descent the outrigger ram.

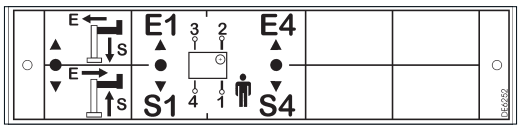
(!) ATTENTION (!)

Operation of the crane outrigger supports must be from the control station on that side; it is not allowed to operate outriggers on the opposite side of the vehicle due to unseen dangers. DE4491 (fig. 7)

fig. 7

Controls workable from the double control side of the crane fig. 6 e fig. 6a

horizontal distributor *fig. 6*



vertical distributor

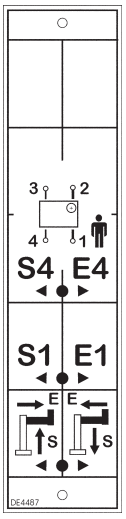


fig. 6a

How to exit the outrigger support **E1** (crane)
- Operate the corresponding lever **CD** towards "**E1**" and keep it in position.
- Operate the lever **C** to exit the outrigger support.

How to descent the outrigger ram **S1** (crane)
- Operate the corresponding lever **CD** towards "**S1**" and keep it in position.
- Operate the lever **C** to descent the outrigger ram.

How to exit the outrigger support **E4** (supplementary outriggers)
- Operate the corresponding lever **CD** towards "**E4**" and keep it in position.
- Operate the lever **C** to exit the outrigger support.

How to descent the outrigger ram **S4** (supplementary outriggers)
- Operate the corresponding lever **CD** towards "**S4**" and keep it in position.
- Operate the lever **C** to descent the outrigger ram.

(!) ATTENTION (!)

The complete extension of the outrigger supports is visually indicated by the yellow triangles which are found at the end of the beam (and of the support if it's supplied with extra double extension beams). (Fig. 8).

fig. 8

The stabilization has to be carried out with care and gradually keeping the vehicle in horizontal levelled condition to prevent springs overloads and chassis torsions.

(!) ATTENTION (!)

During the stabilising operations, for each outrigger ram, it is recommended to DESCENT the outrigger as the last manoeuvre.

To operate the crane controls, after having completed the descent and stabilisation manoeuvres,
- Position lever **D** of oil diverter (- **E/S**) on . (Fig. 1)

Manoeuvres for re-entry of the crane outriggers and supplementary outriggers within the overall vehicle width after crane use.

Position lever **D** of oil diverter (- **E/S**) on **E/S**. (Fig. 1)

How to lift the outrigger ram **S**
- Operate the corresponding lever **CD** towards "**S**" and keep it in position.
- Operate the lever **C** to lift the outrigger ram. (Fig. 2)

How to re-enter the outrigger support **E**
- Operate the corresponding lever **CD** towards "**E**" and keep it in position.
- Operate the lever **C** to re-enter the support. (Fig. 2)

(!) WARNING (!)

Keep hands clear of automatic stop device of the outrigger supports. (Fig. 3-4).

(!) Always check that the outrigger supports, once in their rest position, are locked in their seat by the safety devices, so as to assure the impossibility of accidental movement. (Fig. 3-4).

13.4 Manually tiltable outrigger rams

Outrigger rams are allowed to be stored in an inclined position, when obstructions on the vehicle chassis prevent their vertical stowability. These hinged supports are placed between the outrigger supports and the rams; the fixed part is screwed to the supports while the mobile part is screwed to the rams. (fig 9-9a)

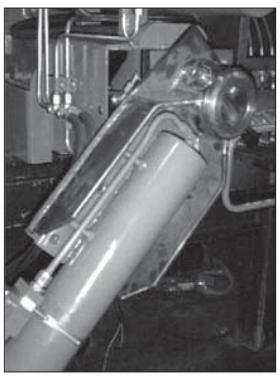


fig. 9

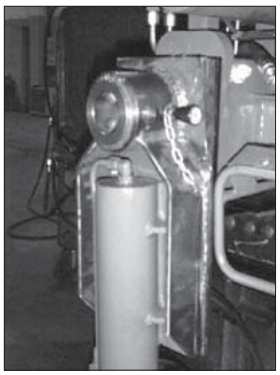


fig. 9a

To place the rams in a working condition. (fig. 9)
- Supporting the ram, remove the check pin and the locking pin from their positions.
- Position, carefully, the ram in working condition, insert the locking pin in its new position and secure it with the check pin (fig. 9a)

To re-position the rams to the folded position.
- Remove the check pin and the locking pin.
- Position, the ram in a upward direction and supporting the ram, insert
- the locking pin in its new position and secure it with the check pin

(!) The locking pin is constructed fromspecial material - do not replace it with a non original part - your security depends on it

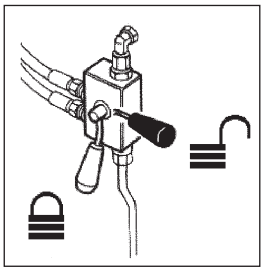


fig. 14

13.5 Crane with hydraulic tiltable supports (with hydraulic motor) for outrigger rams:

(!) ATTENTION (!)

Be very careful during vehicle stabilization operation; make sure that there are no obstacles preventing the rotation of the rams **and that no one is or transits in close proximity of the working area of the outrigger rams.**

- Disengage the locking devices of the outrigger supports by putting the levers **A** from the position of the fig. 10 to the one of the fig. 11.

- Position lever **D** of oil diverter (-**E/S**) on **E/S**.

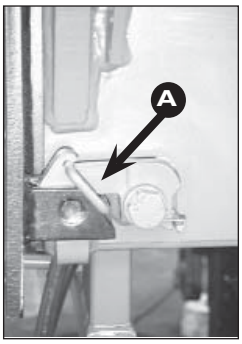


fig. 10

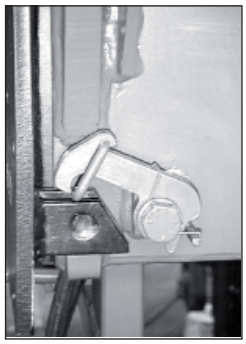


fig. 11

horizontal distributor

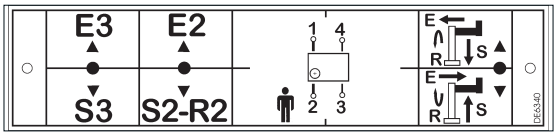


fig. 15

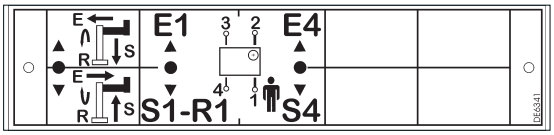


fig. 16

vertical distributor

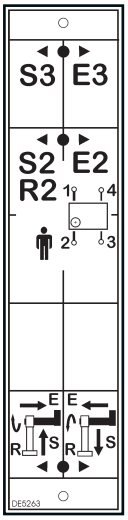


fig. 15a

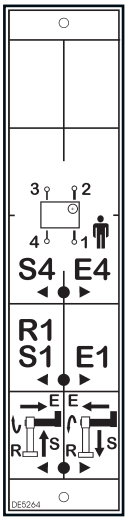


fig. 16a

Controls workable from the distributor side of the crane
fig. 15 **DE6340;** fig. 15a **DE5263**

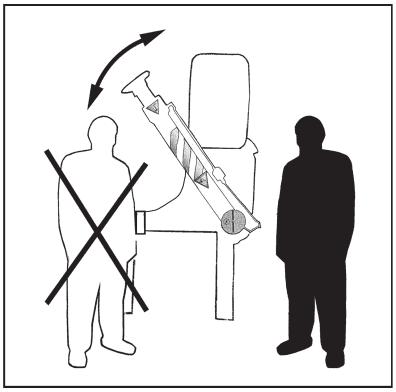
Controls workable from the double control side of the crane
fig. 16 **DE6341;** fig. 16a **DE5264**

- By using the levers **CD**, the lever **C** and the valve taps (fig. 14), extend the outrigger supports, rotate the outrigger rams putting in a working condition and lower them till the complete stabilisation of the vehicle. (Fig. 17-18)

Example of using the levers **CD**, the lever **C** and the valve tap on the outrigger:
- **extension of the outrigger support n°1**
  - activate the corresponding lever **CD** towards "**E1**" and keep it in position;
  - activate the lever **C** towards right to obtain the extension of the support.

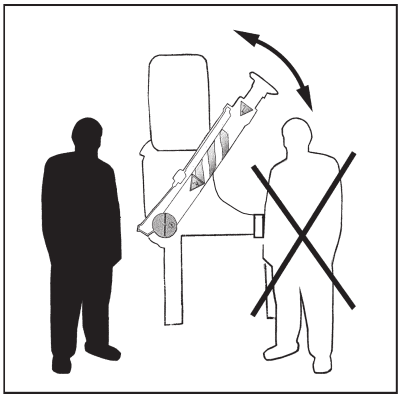
- **rotation of the outrigger ram n°1 from the rest position (fig. 9) to the working condition (fig. 9a)**
  - make sure that the tap **R1** of the valve of the outrigger ram **S1** is closed (for the closed or opened position see fig. 12);
  - before removing the pin **1** proceed as follows:
    - activate the corresponding lever **CD** towards **"S1 R1"** and keep it in position;
    - activate the lever **C** in the opposite direction to control the rotation and take the ram **S1** to its rest position so that the pin **1** is extractable;
    - to remove the pin **1** rotate its handle **B** in the anticlockwise rotation after disengaging the safety device **F**;
  - to rotate the outrigger ram **S1** proceed as follows:
    - activate the corresponding lever **CD** towards **"S1 R1"** and keep it in position;
    - activate the lever **C** in the opposite direction to control the rotation and take the ram **S1** to its working condition.

DISTRIBUTOR SIDE



DE 5733

DOUBLE CONTROL SIDE



DE 5734

DISTRIBUTOR SIDE

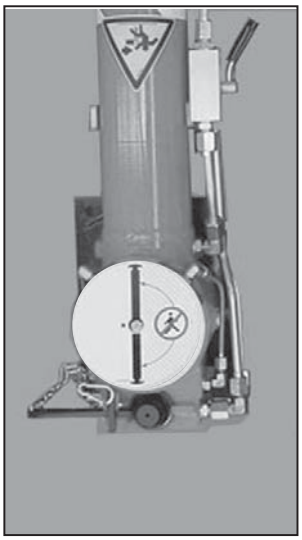


fig. 17

DOUBLE CONTROL SIDE

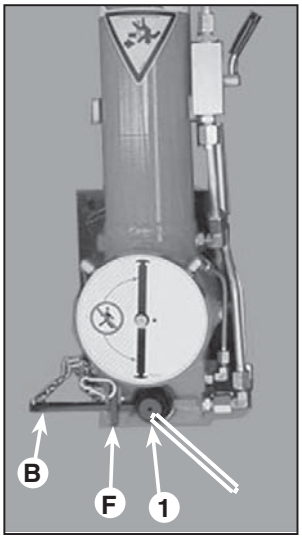


fig. 18

!!! ATTENTION !!!
Make sure that no one is or transits in close proximity of the working area of the outriggers.

  - insert the pin **1** in its new seat and lock it with a clockwise rotation (the safety device **F** sets off automatically);

(!) The locking pin 1 is constructed from special material do not replace it with a non original part - your security depends on it

- **descent of the outrigger ram n°1**
  - open the tap **R1** of the valve of the outrigger ram **S1;**
  - activate the corresponding lever **CD** towards **"S1 R1"** and keep it in position;
  - activate the lever **C** in the opposite direction till the requested extension of the outrigger ram **S1;**
  - close the tap **R1** of the valve of the outrigger ram **S1**.

(!) ATTENTION (!)
The complete extension of the outrigger supports is visually indicated by the yellow triangles which are found at the end of the beam (and of the support if it's supplied with extra double extension beams). (Fig. 8).

The stabilization has to be carried out with care and gradually keeping the vehicle in horizontal levelled condition to prevent springs overloads and chassis torsions.

(!) ATTENTION (!)
During the stabilising operations, for each outrigger ram, it is recommended to DESCENT the outrigger as the last manoeuvre.

To operate the crane controls, after having completed the stabilisation manoeuvres,
- Position lever **D** of oil diverter (- **E/S**) on .
- Position selector (- **E/S**) of the push-button panel on .

Manoeuvres for re-entry of the crane outriggers and supplementary outriggers within the overall vehicle width after crane use.

- Repeat by inverting the sequence of the operations effected for the stabilization of the vehicle.

(!) ATTENTION (!)
Keep hands clear of automatic stop device of the outrigger supports. (Fig. 3-4).

(!) Always check that the outrigger supports, once in their rest position, are locked in their seat by the safety devices, so as to assure the impossibility of accidental movement. (Fig. 3).

14 CONTROLS TO OPERATE THE CRANE

14.1 Generality

(!) WARNING (!)

Before operating the crane it is compulsory to set the outriggers. (Plate DE6723 fig. 1)

The crane and hydraulic implements can be manually operated with:
- with the radio-remote control
- with controls from the emergency station from the column (if accessible)
- ground controls on both sides.

The plates reported over each lever define their function in relation to their movement.

FASSI
ATTENZIONE: PRIMA DI AZIONARE LA GRU E' OBBLIGATORIO METTERE IN OPERA GLI STABILIZZATORI.
WARNING: BEFORE OPERATING THE CRANE IT IS COMPULSORY TO EXTEND THE OUTRIGGERS.
ATTENTION: AVANT D'UTILISER LA GRUE IL EST OBLIGATOIRE DE METTRE EN FONCTION LES STABILISATEURS.
ACHTUNG: VOR INBETRIEBNAHME DES KRANS MUESSEN DIE ABSTUETZUNGEN AUSGEFAHREN.
ATENCIÓN: ANTES DE ACCIONAR LA GRÚA ES OBLIGATORIO ESTABILIZAR EL VEHÍCULO.
ATENÇÃO: ANTES DE UTILIZAR A GRUA É OBRIGATÓRIO COLOCAR EM FUNCIONAMENTO OS ESTABILIZADORES.
DE6723

fig. 1

14.2 Radio-remote control

14.2.1 Use of the radio-remote control

(!) WARNING (!)
First read the instructions given in the User's Manual supplied by the Manufacturer before using the remote control to avoid improper use.

The plates shown on the side of each push-button panel lever of the radio remote control determine the operation of the levers in relation to the movement of the crane.

(!) ATTENTION (!)
The sequence of the plates placed on the crane controls may be different.
Make sure that the lever you are going to operate correspond to the control you selected.

(!) Operate the levers smoothly and gradually (!)
When carrying out simultaneous movements of two or more functions, also related to pump flow and lever travel, it is possible that on reaching the stroke end of a particular function, an increase in speed of the other functions will occur.

Tele-radio remote control
The radio remote control, in the case of a discharged battery or in the presence of interference in the radio transmission, or use of the crane in situations where the transmission by radio is forbidden, can be easily transformed into tele-radio remote control.
Connect the push-button panel and the socket, indicated by the DE6998 plate (fig. 2), placed on the base with the serial cable (supplied with the radio remote control); the battery of the push-button panel may be left (even if it will not be charged); and turn push-button panel on, using the ignition key (fig 6).

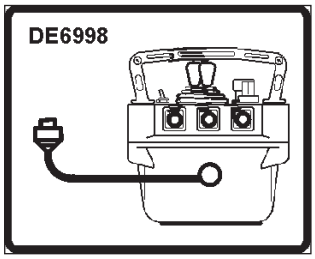


fig. 2

If the remote radio control does not work, you can use the emergency distributor to put down the load on the ground. Read attentively paragraph 16.8.1, before using it.

14.2.2 Push-button panel of the radio-remote control "RCH"

Description

The push-button panel of the radio remote control **"RCH"** in its standard configuration, features 6 linear levers (but it can allocate up to 8) and a display where it is possible to visualize information about the use of the crane.
Optionally, the push-button panel can be supplied with joystick controls with 6 or 8 functions. The 8-function version features two side joysticks with 3 functions; the third function is available through the rotation of the joystick head.

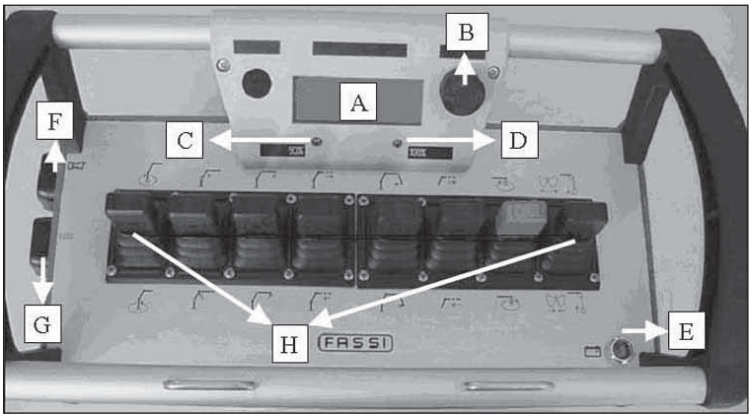


fig. 3

Each push-button panel element is identified with letters of the alphabet as shown in figures 3,4,5,6,7: check the list down below to get the meaning of each element.

A) Graphic Display visualizing the pressure on the lifting rams, alarms, various information and icons for the selection of the different menus
B) Function selector with rotary movement **"RX"** to select the icons of the program menus (see the icon legend, par. 14.2.3). press on the selector to confirm the choice.
C) Yellow Led indicating 90 % load capacity
D) Red Led indicating the load capacity exceeds 100 %. The moment limiting device is activated.
E) Battery condition visual indicator. Correct functioning (charged battery) is indicated by a green flashing. Red flashing with audible bleep indicates that the battery is almost discharged and needs to be replaced.
F) Activation push-button for acoustic alarm (see instructions and warnings).
G) **"INDEX"** push-button to program or select menus.
H) Linear levers for crane control
I) Socket for radio remote control serial cable. Standard radio remote control is supplied with 10mt-long serial cable connecting the push-button panel with the socket on the base (placed under the protection guard of the distributor).
L) Push-button panel ignition key. When the key is in **"0"** position, the push-button panel is off, when in **"1"** position, the push-button panel is on (the emergency button must be released).
M) Mushroom-shaped emergency button.
N) Battery.

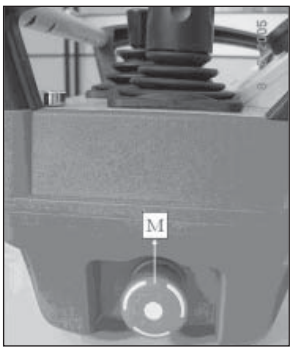


fig. 4

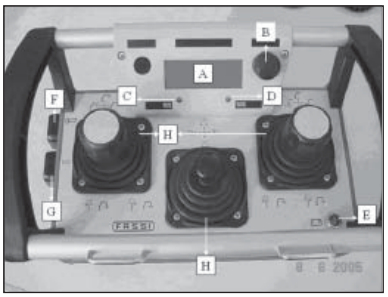


fig. 5

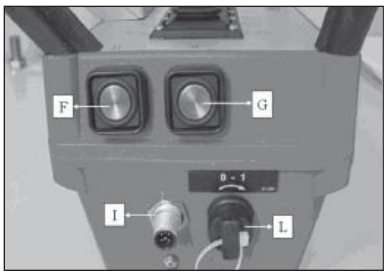


fig. 6

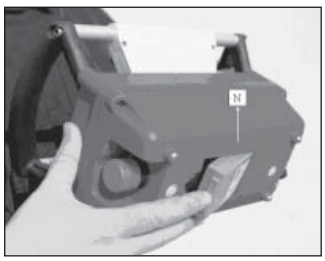


fig. 7

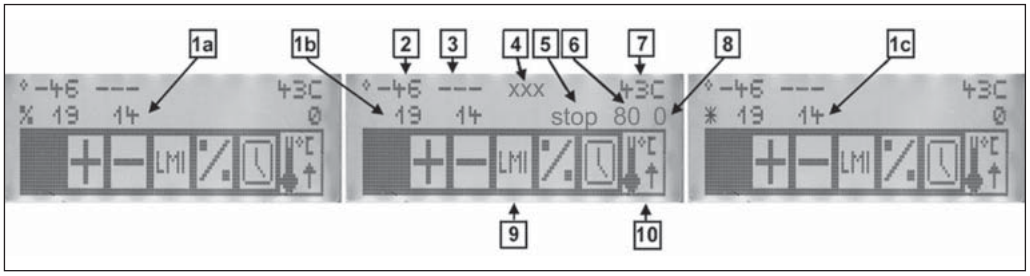


fig. 8

Radio remote control initial display:

Check the list down below to get the meaning of the elements identified with letters of the alphabet as they are displayed when turning on the push-button panel, as shown in figure 8.

1 a. Load on the crane lifting rams, expressed in percentage.
1 b. Pressure in the crane lifting rams, expressed in bars.
1 c. Pressure in the crane lifting rams, expressed in daPsi*.
2. Crane angle monitored by the angle sensor placed on the outer boom.
3. Hydraulic extension angle monitored by the angle sensor placed on extension arm (the extension is not present in this case).
4. Space for messages
5. Information messages (see list in par. 14.2.3).
6. Load on the winch (if fitted), expressed in percentage.
7. Oil temperature monitored by the temperature sensor.
8. Pressure in the hydraulic distributor .
9. Icons.
10. Flags

14.2.3 Icon legend valid for the display of both radio remote control and graphic panel (GUI ver002)

ENTER

+ (to increase values when modifying the parameters or to navigate the menus in progression).

- (to decrease values when modifying the parameters or to navigate the menus in regression).

LMI Activation of the procedure for the temporary exclusion of the lifting moment limiting device, and for the reset of the messages **"alarm"** and **"warning".**

Modification of the values displayed: pressure in Bar, load in **%**, pressure in dapsi, **crane angle** in degrees (**jib angle** in degrees, oil **temperature**.

Clock activation and access to the timer menu.

XP Activation/disactivation **"XP"** device.

PM Activation of the load check procedure on manual extensions (only on the graphic display).

RPM To increase truck's engine r.p.m.

RPM To decrease truck's engine r.p.m.

ENG ON Starting the truck engine.

ENG OFF Turning off the truck engine.

Decrease in crane general speed (each selection reduces speed by the percentage set in the parameter visualised on **"Lnn"**).

Selection of the 9°/10° function on the radio remote control.

Visualization of active "flag" icons in addition to the one selected.

Access to the setting menu (only on graphic panel).

Upon activation the setting menu of the graphic panel is displayed (lightness, contrast, etc.).

Modification of load values from % to Bar on crane layout (only on graphic panel).

? Visualisation of the software release (only on graphic panel).

Working lights turned on.

"FLAG": warning icons not selectable with selector **"RX"**

Warning icon indicating the activation condition of the general speed reduction.

90% Icon signalling 90% load capacity.

100% Icon signalling that load capacity exceeds 100% (activation of the moment limiting device).

DCS L1 Downgrade to level 1.

DCS L2 Downgrade to level 2.

LMI Icon signalling the activation of the procedure for the temporary exclusion of the lifting moment limiting device.

FC Icon signalling the activation of the photocell located on the control station on the top seat (operator is present).

°C Icon signalling oil temperature in the tank (only on graphic panel and on cranes fitted with heat exchanger).

Information messages:

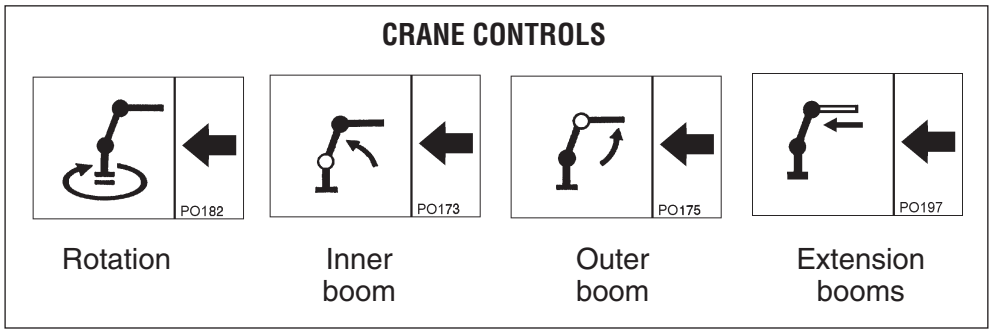
STOP ROTATION	The **"ROTATION STOP"** is activated (see par. 16.6)
MAX ANGLE CRANE	The **"LIFTING STOP"** is activated by the crane angle sensor (see par. 16.4.3)
MAX ANGLE JIB	The **"LIFTING STOP"** is activated by the hydraulic jib angle sensor (see par. 16.4.3)
STOP BOOM OUT	The **"WINCH STOP"** is activated by the boom out stop (see par. 16.4.3)
NOT ALLOWED	The manoeuvre is not allowed
WARNING ANGLE	warning upon reaching the **"lifting block"** activation angle (only on graphic display)
CRANE FOLDED	The crane is folded (see par. 16.4.4)
STOP	The emergency stop button is pressed
JIB OFF!	The hydraulic jib is not electrically connected; it's not possible to maneuvre it (see par. 20.6)
BATTERY LOW!	The FX800 battery is getting low
WINCH CAL. ERROR	The winch limiting device is not correctly calibrated, repeat the calibration as soon as possible.
WINCH OFF!	Intervention of the **"WINCH OFF"** caused by the rope being completely unwound (see par. 16.4.2)
START ENGINE	Starting the truck engine
STOP ENGINE	Turning off the truck engine

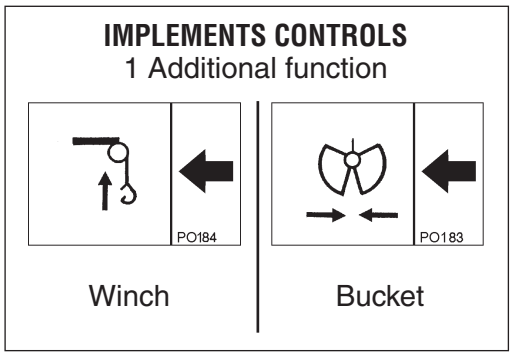
14.3 Emergency station from the column (if accessible) or control station (version with load limiting device)

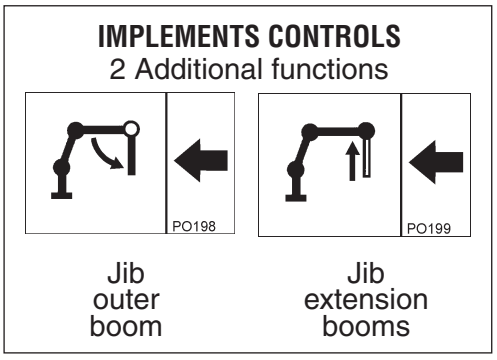
(!) ATTENTION (!)

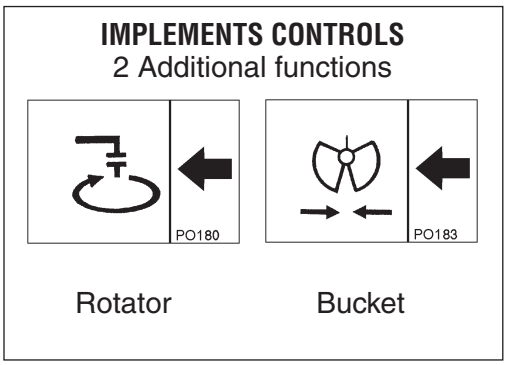
The sequence of the plates placed on the crane controls may be different.

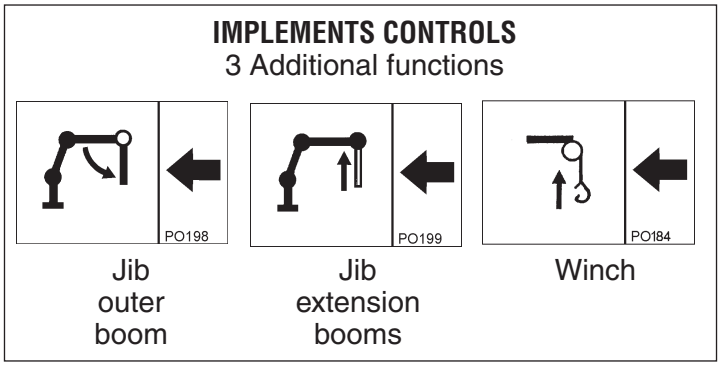
Make sure that the lever you are going to operate correspond to the control you selected.











(!) Operate the levers smoothly and gradually (!)

When carrying out simultaneous movements of two or more functions, also related to pump flow and lever travel, it is possible that on reaching the stroke end of a particular function, an increase in speed of the other functions will occur.

(!) ATTENTION (!)

While exiting and folding the crane, you must operate from the distributor side; it is forbidden to operate from the double control side because of the overall dimensions of the booms. (DE6400 fig. 9)

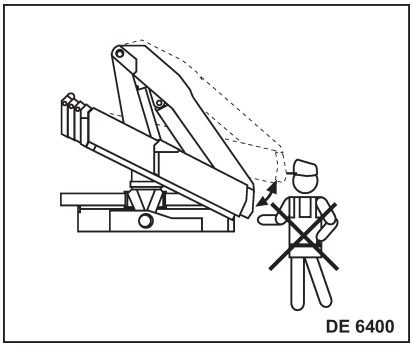


fig. 9

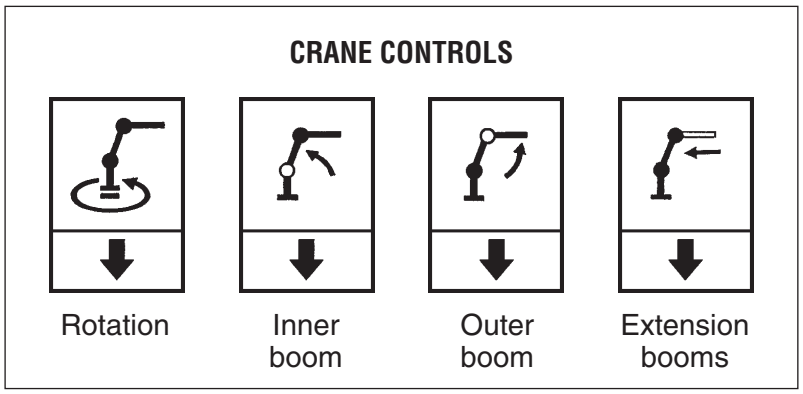
DE 6409A

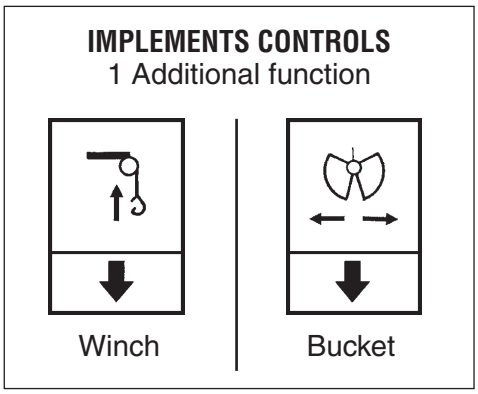
VERSION WITH HORIZONTAL CONTROLS (ground controls or top seat controls)

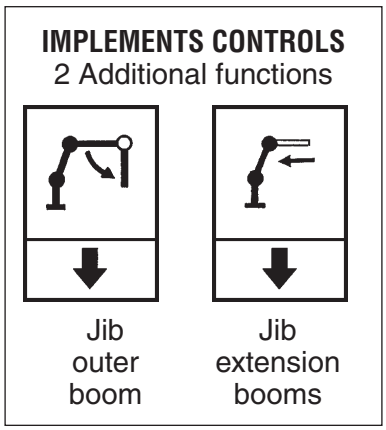
(!) ATTENTION (!)

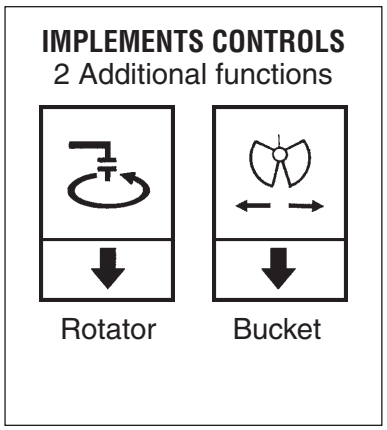
The sequence of the plates placed on the crane controls may be different.

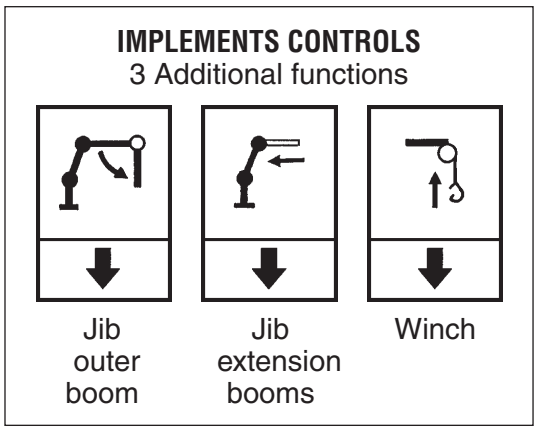
Make sure that the lever you are going to operate correspond to the control you selected.











(!) Operate the levers smoothly and gradually (!)

When carrying out simultaneous movements of two or more functions, also related to pump flow and lever travel, it is possible that on reaching the stroke end of a particular function, an increase in speed of the other functions will occur.

(!) ATTENTION (!)

While exiting and folding the crane, you must operate from the distributor side; it is forbidden to operate from the double control side because of the overall dimensions of the booms. (DE1684A fig. 15)

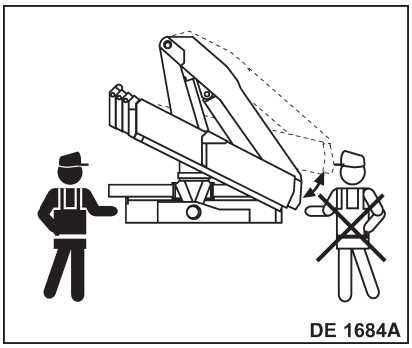


fig. 15

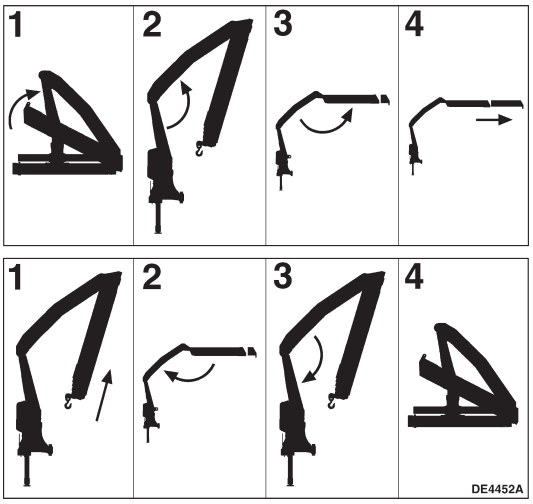
14.4 Manoeuvres to unfold the crane into a working condition

The plate DE4452A indicates the sequence of the manoeuvres to be carried out to unfold and to fold the crane.

- Engage the power take off.
- Stabilize the vehicle (see details on Paragraph 13 “Manoeuvres and controls to stabilize the vehicle”).

**(!) IT IS FORBIDDEN TO OPERATE NEAR (!)
THE BOOMS IN MOUVEMENT**

(!) Operate from ground control distributor side (!)

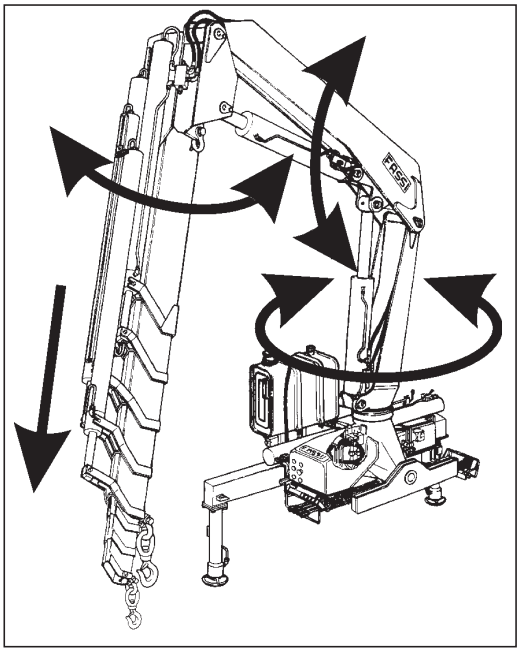


By operating the corresponding levers:
- make sure that the extension booms and the outer ram are closed;
- lift the inner boom over the horizontal line;
- open the outer boom to the “horizontal” position;
- position the hook on the vertical line above the load.

14.5 Manoeuvres to fold the crane into the rest condition (see Plate DE445 2A)

**(!) IT IS FORBIDDEN TO OPERATE NEAR (!)
THE BOOMS IN MOUVEMENT**

(!) Operate from ground control distributor side (!)



By operating the corresponding levers:
- fold the extension booms to their stroke end;
- lift the inner boom to its stroke end;
- fold the outer boom to its stroke end;
- rotate the crane until the reference arrows coincide (on the column and on the base);
- fold the inner boom to its stroke end; the rest locating pin locates into its seat;
- re-position the outriggers to within the overall vehicle width as described on Paragraph 13.

**(!) IF THE HOOK GOES OUT OF SIZE WITH THE CRANE FOLDED (!)
IT MUST BE TAKEN OF BEFORE STARTING THE TRUCK**

NOTE **A safety device is installed on the outer boom of the crane version "C" preventing the exit of the extension boom sections when the crane is in rest position.**

14.6 Manoeuvres to unfold the crane "C" into a working condition (only for the crane version C")

(!) IT IS FORBIDDEN TO OPERATE NEAR (!)
THE BOOMS IN MOUVEMENT

(!) Operate from ground control distributor side (!)

By operating the corresponding levers:
- Lift the inner boom over the horizontal line.
- Open the outer boom to the "horizontal" position.
- Extend the extension boom sections; the hook of the safety device is free.

- Position the hook on the vertical line above the load.

14.7 Manoeuvres to fold the crane "C" into the rest condition (only for the crane version "C")

(!) IT IS FORBIDDEN TO OPERATE NEAR (!)
THE BOOMS IN MOUVEMENT

(!) Operate from ground control distributor side (!)

By operating the corresponding levers:
- completely reenter the extension boom sections;
- lift the inner boom close to its stroke end;
- fold the outer boom to its stroke end;
- lower the inner boom until the hook of the safety device rests on the extension boom sections;
- reenter the extension boom sections and suitions and suitably lock them in place by means of the hook;
- do not insist on the control!
- rotate the crane until the reference arrows coincide (on the column and on the base);
- fold the inner boom to its stroke end; the rest locating pin locates into its seat;
- re-position the outriggers to within the overall vehicle width as described on Paragraph 13.

(!) IF THE HOOK GOES OUT OF SIZE WITH THE CRANE FOLDED (!)
IT MUST BE TAKEN OF BEFORE STARTING THE TRUCK

14.8 Indicator of inner boom horizontal position (on request)

The column is fitted with a device that informs the driver through a sound/light signal in the cab, that the inner boom max position allowed during transport on road has been exceeded.

16 MANOEUVRES OF THE CRANE LOADS

16.1 Generality

(!) Before manoeuvring the load, verify that the working area is suitable for your crane.

The lifting curves of the capacity plate indicate the maximum load that the crane can lift at a certain radius and at a certain height. To utilize the maximum capacity of the crane, it is necessary to position the inner boom as indicated on the capacity plate. During load handling, do not exceed the reach limits given, or the load indicated on the above mentioned charts. If the limits are exceeded, the limiting device, allowing all manoeuvres, which reduce the lifted load within the permitted reach limits and forbid all other manoeuvres,
will be immediately activated.

Lifting moment limiting device
A characteristic which permits the classification of cranes is their lifting capacity or maximum lifting moment. The moment is defined by the value obtained from the weight of the load to be lifted (**kg**) by its distance (**meters**) from the centreline of the crane rotation.
The device called **"lifting moment limiting device"** preserves the crane structure from overloads, as it prevents any movement which increases the value of the moment up to the maximum established value.

(!) ATTENTION (!)
The presence of the lifting moment limiting device does not release the user from the obligation to respect what is indicated on capacity plates and lifting curves.

16.2 Lifting moment limiting device "EVOLUTION" (LMEV) and automatic dynamic control (ADC)

This device utilises an electro-hydraulic system managed by an electronic logic that prevents any operation tending to cause an increase in the pressure induced by the load in the lifting rams (inner, outer rams of the crane and of the hydraulic extension, if fitted), up to the critical values. These values, which are not exceedable, determine the intervention levels and provide the data for setting the device.
The pressure values detected in the lifting rams are turned into electric signals by the transducers, and sent to the electronic logic of the device which determines the locking or unlocking of the controls concerned, according to the horizontal position of the crane outer boom; only the controls allowing a reduction of the overload are enabled, while those increasing it are disabled.
The device features an electro-hydraulic control that does not allow the set value to be exceeded, by deactivating the controls commanded by the limiting device. When the controls are released (levers in neutral position) it's this electronic logic that handles which manoeuvres are disabled, according to the position of the crane outer boom and in overload condition, by sending electric signals to special micro-switches placed on the elements of the distributor.

The ADC device (if fitted) can be activated only through the radio remote control. It controls the dynamics of the movements by limiting the distributor control levers run according to the pressure of the hinged rams in movement, thus providing the maximum speed available subject to the applied load. When using manual controls (therefore the ADC system is not enabled), the oil capacity is automatically reduced in order to avoid excessive dynamic solicitations.

(!) ATTENTION (!)
The ADC device is not active on winch controls and on accessories other than the hydraulic jibs.
Practically the speed of the load movement decreases as the intervention limit of the lifting moment limiting device approaches.

Any movement (ram) (including the rotation) acts on all the movements, exclusive of the re-entry/exit of the boom sections (provided that this speed is too low).

(!) ATTENTION (!)

This control of the dynamics and therefore of speed engenders a variation of the movement speed of the crane also without varying the position of the control levers. (For instance when putting down on the ground the load hanged on the winch, the crane movement gradually accelerates even if the control lever of the radio remote control is kept unchanged).

16.3 Control panels of the lifting moment limiting device (if fitted)

There are three types of control panels: Graphic, Alphanumeric or Basic.

GRAPHIC PANEL

Refer to fig. 1 to identify the various components of the panel:

1 Green, yellow and red led band signalling the load percentage as compared to the capacity plate. Green light load between **0** and **90%**. Yellow light load between **90** and **100%**. Red light load higher than **100%** (activation of the lifting moment limiting device).
2 Graphic Display visualizing the pressure on the lifting rams, alarms, various information and icons for the selection of the different menus.
3 Mushroom-shaped emergency button (always active).
4 **"INDEX"** push-button to program or select menus.
5 Audible alarm push button (see instructions and warnings).
6 Control button for the temporary exclusion of the lifting moment limiting device, and for the reset of the messages **"alarm"** and **"warning"**.
7 Function selector with rotary movement **"RX"** to select the icons of the program menus (see the icon legend, par. 14.2.3). Press on the selector to confirm the choice.
8 Red led light-flashing for **"warning"** or fixed for **"alarm"**.
Led lights 4-6. If led lights 4 and 6 are flashing the panel is not enabled (emergency excluded); contemporarily press on push-buttons 4 and 6 to activate it.

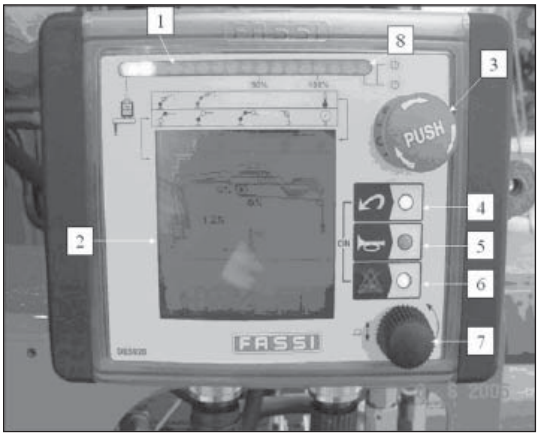


fig. 1

ALPHANUMERIC PANEL

Refer to fig. 2 to identify the various components of the panel:

1. Green, yellow and red led band signalling the load percentage as compared to the capacity plate. Green light load between 0 and **90%**. Yellow light load between **90** and **100%**. Red light load higher than **100%** (activation of the lifting moment limiting device)
2. Alphanumeric Display visualizing the pressure on the lifting rams, alarms, various information and icons for the selection of the different menus.
3. Mushroom-shaped emergency button (always active).
4. Push-button to select the use of buttons 5, 6, 7, 8, 9 in configuration "**A**" or "**B**". If the light is on, the "**A**" mode is enabled, if the light is off, the "**B**" mode is enabled.

5A. Control button for the temporary exclusion of the lifting moment limiting device, and for the reset of the messages "**alarm**" and "**warning**".

6A. "**XP**" device push-button

7A. Audible alarm push button (see instructions and warnings).

8A. Push-button to modify the values displayed: pressure in Bar, load in **%**, pressure in dapsi, crane angle in degrees, jib angle in degrees, oil temperature.

9A. Button for the clock activation and to access the timer menu (see timer 16.7).

5B. **+** button (to increase values when modifying the parameters or to navigate the menus in progression).

6B. **-** button (to decrease values when modifying the parameters or to navigate the menus in regression).

7B. "**INDEX**" push-button to program or to select menus.

8B. "**ENTER**" button used to program or to select menus.

9B. F2 button (actually not in use).

10. Red light-flashing for "**warning**" or fixed for "**alarm**".
Led lights 4-6. If led lights 4 and 6 are flashing the panel is not enabled (emergency excluded); contemporarily press on push-buttons 4 and 6 to activate it.

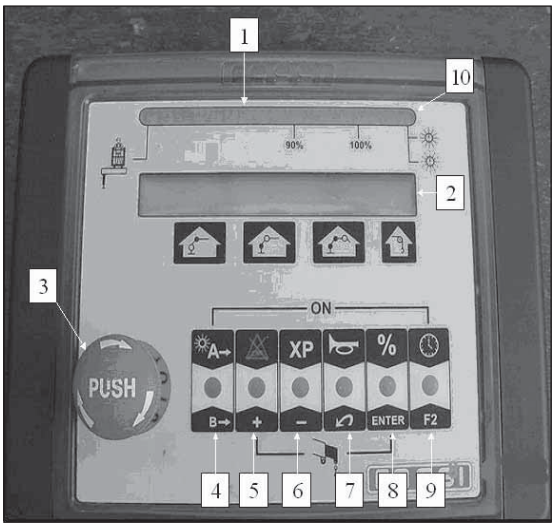


fig. 2

BASIC PANEL

Refer to fig. 3 to identify the various components of the panel:

1 Green, yellow and red led band signalling the load percentage as compared to the capacity plate. Green light load between **0** and **90%**. Yellow light load between **90** and **100%**. Red light load higher than **100%** (activation of the lifting moment limiting device). The red light can also signal **"warning"** if flashing, or **"alarm"** if fixed.
2 Orange light signalling that the **XP** device is enabled.
3 Mushroom-shaped emergency button (always active).
4 Green light signalling tension in he panel; if flashing, it indicates the presence of the operator in the third control station.
5 Control button for the temporary exclusion of the lifting moment limiting device, and for the reset of the messages **"alarm"** and **"warning"**.
6 **"XP"** device push-button.
7 Audible alarm push button (see instructions and warnings).
2-4 Lights 2-4 are flashing during the exclusion procedure of the lifting moment limiting device.

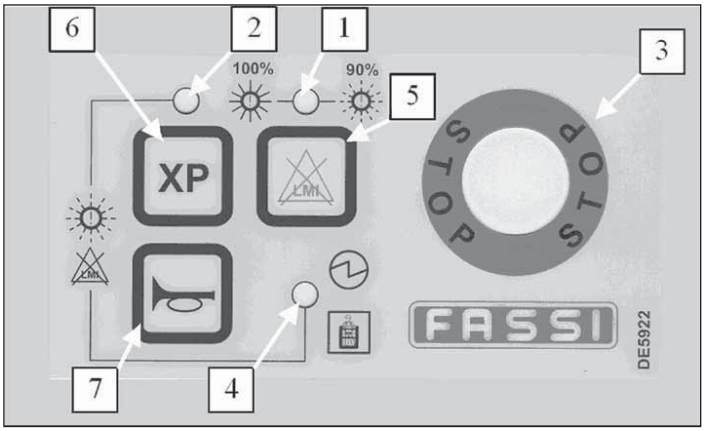


fig. 3

16.4 Load handling

Any block condition requiring the distributor unloading does not allow the use of hydraulic accessories (bucket, rotator, …); these could however be activated when coupled with permitted manoeuvres.

16.4.1 "Block due to overload condition"

According to the type of block and to the crane configuration, the only manoeuvres permitted are the ones allowing a reduction of the overload, as follows:

Crane in overload condition with outer boom and hydraulic jib under the horizontal line

Manoeuvres not allowed
- Inner boom lift - Outer boom lift - Exit of the crane extension boom sections (if the overload is created by the hydraulic jib, it can still operate) - Hydraulic jib lift (if crane is equipped with) - Exit of the jib extension boom sections (if crane is equipped with) - Winch lift (if crane is equipped with)

Crane in overload condition with outer boom under the horizontal line and hydraulic jib horizontal

Manoeuvres not allowed
- Inner boom lift - Outer boom lift - Exit of the crane extension boom sections (if the overload is created by the hydraulic jib, it can still operate) - Exit of the jib extension boom sections (if crane is equipped with) - Winch lift (if crane is equipped with)

Crane in overload condition with outer boom under the horizontal line and hydraulic jib over the horizontal line

Manoeuvres not allowed
- Inner boom lift - Outer boom lift - Exit of the crane extension boom sections (if the overload is created by the hydraulic jib, it can still operate) - Hydraulic jib descent (if crane is equipped with) - Exit of the jib extension boom sections (if crane is equipped with) - Winch lift (if crane is equipped with)

Crane in overload condition with outer boom horizontal and hydraulic jib under the horizontal line

Manoeuvres not allowed
- Inner boom lift (only if the overload is created by the hydraulic jib) - Outer boom lift (only if the overload is created by the hydraulic jib) - Exit of the crane extension boom sections (if the overload is created by the jib ram, it can still operate) - Hydraulic jib lift (if crane is equipped with) - Exit of the jib extension boom sections (if crane is equipped with) - Winch lift (if crane is equipped with)

Crane in overload condition with outer boom and hydraulic jib horizontal

Manoeuvres not allowed
- Exit of the crane extension boom sections (if the overload is created by the hydraulic jib, it can still operate) - Exit of the jib extension boom sections (if crane is equipped with) - Winch lift (if crane is equipped with)

Crane in overload condition with outer boom horizontal and hydraulic jib over the horizontal line

Manoeuvres not allowed
- Exit of the crane extension boom sections (if the overload is created by the hydraulic jib, it can still operate) - Hydraulic jib descent - Exit of the jib extension boom sections (if crane is equipped with) - Winch lift (if crane is equipped with)

Crane in overload condition with outer boom over the horizontal line and hydraulic jib under the horizontal line

Manoeuvres not allowed
- Inner boom lift (only if the overload is created by the hydraulic jib) - Inner boom descent - Outer boom lift (only if the overload is created by the hydraulic jib) - Outer boom descent - Exit of the crane extension boom sections (if the overload is created by the hydraulic jib, it can still operate) - Hydraulic jib lift (if crane is equipped with) - Exit of the jib extension boom sections (if crane is equipped with) - Winch lift (if crane is equipped with)

Crane in overload condition with outer boom over the horizontal line and hydraulic jib horizontal

Manoeuvres not allowed
- Inner boom descent - Outer boom descent - Exit of the crane extension boom sections (if the overload is created by the hydraulic jib, it can still operate) - Exit of the jib extension boom sections (if crane is equipped with) - Winch lift (if crane is equipped with)

Crane in overload condition with outer boom and hydraulic jib over the horizontal line

Manoeuvres not allowed
- Inner boom descent - Outer boom descent - Exit of the crane extension boom sections (if the overload is created by the hydraulic jib, it can still operate) - Hydraulic jib descent (if crane is equipped with) - Exit of the jib extension boom sections (if crane is equipped with) - Winch lift (if crane is equipped with)

Note: In case of alarm to be reset on sensors TI1 and TI2 (inclinometers on outer boom and extension boom), not knowing the crane configuration, the block is activated on manoeuvres both above and under the horizontal line.

(!) ATTENTION (!)

During load handling with the crane and with the crane and hydraulic jib, in vertical configuration or close, the operator must strictly refer to the loads indicated on the capacity plates since the limiting device shows to be not particularly sensitive with vertical lifts.

16.4.2 "Winch off" (when fitted)

Crane in overload condition by the intervention of the load limiter of the winch

Manoeuvres not allowed
- Clockwise/anticlockwise rotation - Inner boom lift/descent - Outer boom lift/descent - Exit of the crane extension boom sections - Hydraulic jib lift/descent (if crane is equipped with) - Exit of the jib extension boom sections (if crane is equipped with) - Winch rope lift

Crane in overload condition for winch rope totally unwound

Manoeuvres not allowed
- Winch rope descent

16.4.3 "Lifting block" (Pro link)

Function of the safety device controlling the articulation "pro link"
When the first angle limit **alfa1** is reached, the safety device temporarily stops all movements and activates the flashing red light; **"Warning angle"** is displayed on the screen. In order to reactivate all the crane functions (except for the lifting of the inner boom that in this case is definitely disabled) just put the all the levers in neutral position. Press the **LMI** button to remove the message **"Warning angle"** (it will disappear when the temporary block angle **alfa1** is no longer exceeded).
When the second angle limit **alfa2** is reached, the safety device definitively stops all lifting movements and activates the fixed red light; **"Max angle crane"** or **"Max Angle jib"** are displayed according to which boom has reached the limit.
The outer booms of the crane and of the hydraulic jib can reach both the **alfa1** (temporary block) and **alfa2** (definitive block) limits, independently from the position of the other booms.
But if one of these two booms reaches the second limit **alfa2**, this condition evidently stops any other lifting.

Only if neither the crane outer boom nor the hydraulic jib reach the first angle limit **alfa1**, the inner boom can attain its max limit **alfa2**, that is its mechanic stroke end.

Lift stop by the activation of crane angle sensor

Manoeuvres not allowed
- inner boom lift - outer boom lift

Lift stop by the activation of hydraulic jib angle sensor

Manoeuvres not allowed
- inner boom lift - outer boom lift - hydraulic jib lift - winch lift

16.4.4 Other functional characteristics

Crane block by the attainment of the mechanical stroke end of the lifting ram.
The limiting device may intervene also during loadless crane operation following a pressure peak provoked by the attainment of the stroke end of the lifting ram at high speed. In this condition, the permitted manoeuvres can be activated, but to reset the block it is necessary to perform the opposite manoeuvre to the one that caused the block. Then the limiting device checks if the pressure goes down and therefore decides whether to remove the block, or to maintain it. Such type of reset works only one time.

Activation of the temporised exclusion device of the lifting moment limiting device

Such device has been added in order to solve the problem of the lifting of heavy and bulky loads with the extension boom sections almost completely re-entered. Once above the horizontal line (with pressure reaching the activation level of the lifting moment limiting device), during the load descent, due to the dynamic overload caused by the descent, the lifting moment limiting device is activated and therefore it becomes impossible to put down the load on the ground.
The temporised exclusion device sets remedy to what described above as follows:
With the crane in block condition, maintain the command for the extensions boom re-entry until stroke end until **"LMI"** is displayed at the top right corner of the radio remote and contemporarily the icon (flag) is displayed at the right end corner.
Release the lever commanding the extensions booms and then press the exclusion device button of the lifting moment limiting device (if the procedure has been correctly executed, **"ELMI"** will be displayed at the top right corner of the radio remote controller). From this moment on you have at your disposal **five (5)** seconds to carry out the descent of the outer boom in order to bring the load under the horizontal line and therefore put it down on the ground. As soon as the crane exits the block, **"ELMI"** is no more displayed.
After the execution of such manoeuvre (5 seconds) wait at least **one (1)** minute in order to be allowed to carry out the manoeuvre once again.

(!) ATTENTION (!)
Activation of the exclusion device of the lifting moment limiting device.
Only the outer boom descent is allowed.

When the operator uses this device, it means that he wishes to override the lifting moment lifting device in order to make some manoeuvres (which would be impossible with the device active) that bring the moment to within the maximum level, but involve an overload condition.
In such an emergency condition (where the lifting moment limiting device has been disabled), the operator, who is the main responsible for the machine safety, must:

- **carefully consider the manoeuvres required to return to normal working conditions: it is however compulsory to effect the re-entry of the extension booms at first,**
- **calmly and carefully assess the type and scale of the hazards arising from these manoeuvres and the possible reaction of the crane (tipping over, frame overload, uncontrolled fall of the load due to a hydraulic system overload etc.);**
- **make all movements as slowly as possible to reduce the dynamic over load to the minimum**

Crane folded into the rest position

We introduced the handling of the crane in the rest condition. When you fold the crane to its rest position, the angle sensor detects a value around 90°, thus disabling the lifting manoeuvres. In order to obviate to this condition, when turning on the crane, if it exceeds the limit values, the message **"CRANE FOLDED"** will be displayed on the main unit. At this point the only manoeuvre allowed is the folding of the outer ram (according to the manual for Use and Maintenance, this is the first manoeuvre to be executed when unfolding the crane). If during this manoeuvre the pressure in the outer ram goes down for at least two seconds, then the crane is considered in rest condition, the messages **"CRANE FOLDED"** disappears and all the manoeuvres are allowed.

NOTE: the message **"CRANE FOLDED"** is displayed also when the crane is turned off with the booms in **"LIFTING BLOCK"** condition and then the crane is turned back on; descend the outer boom below the horizontal line in order to remove the message.

fig. 4

16.4.5 Visual indicator yellow/red light

The crane is fitted with visual indicator of the following signals: yellow light upon reaching 90% and red light upon activation of the lifting moment limiting device. The visual indicator (fig. 6) is in full view on the structure of the crane or of the vehicle.

NOTE: If the radio-remote control is off or however one cannot comunicate with the crane (receiver) the yellow and red warning lights alternately flash.

16.5 Lifting moment limiting device for two working sectors

In case of one sector of the working area with reduced stability of the vehicle (e.g. sector in front of vehicle cab) the limiting device can be provided with a special function which allows to operate with a reduction of the intervention level. The reduction of the intervention level reduces the crane capacity values and this reduction value is defined in the vehicle stability calculation.
Consequently the working area is divided in one sector (e.g. body side) where the crane works according to the capacity plate values and another sector (e.g. cab side) where it works with reduced capacity values. The device has consequently two intervention levels which are activated in relation to the sector of the crane working area always securing the vehicle stability.

(!) ATTENTION (!)

If the rotation stops by going through the working zone where the crane can operate according to the capacity plate values to the one where it can operate according to the reduced values, it means that one of the following conditions is reached:

- rotation of a load bigger than the one admitted in the reduced sector defined in the vehicle stability calculation;
- rotation without load applied but with (at least) one of the inner, outer rams of the crane or the jib (if fitted) extended and pressurised at the stroke end.

The following manoeuvres are allowed:

- the opposite rotation
- the manoeuvres allowed by the limiting device

If a reduction of capacity is necessary because of insufficient stability of the complete unit, new capacity plates must be fixed giving the derated capacity in accordance with the final stability test.

(!) ATTENTION (!)

Always check carefully that the vehicle is perfectly stable, paying special attentino to the area immediately in front of the driver's cabin as this is usually less stable.

16.6 "Rotation limiting device"

When a sector of the working area exists in which the stability is insufficient (for example in the area in front of the cab) the permitted arc of rotation is limited by means of an adjustable electro-hydraulic device which only allows operation within the safe area.
When exceeding the "safe area" the rotation limiting device only allowing:
- the opposite rotation
- the manoeuvres allowed by the limiting device.

16.7 Setting menu

How to visualise the data

· Press the clock button to have the current date visualized on display

How to activate the timer:

<< Partial timer >>:

· Start from the main screen showing pressures in the lifting rams, and select the **"CLOCK"** icon until **"TIME"**is displayed
· select the icon : **"Partial Time"** is displayed,
· select the icon **"ENTER"** to read the value on the timer.
· To reset the partial time, do as follows:
· keep the icon pressed until you read **"TIME"** on the display,
· select the icon to read **"Partial Time"** on the display,
· select again the icon : **"Total Time"** is displayed,
· select again the icon : **"Work Time"** s displayed,
· select again the icon : **"Reset Partial"** is displayed,
· select the icon to read **"Enter to Confirm"** on the display,
· select again : the timer is reset and it will start recording again.

<< Total Time (total activation time of the electric panel)>>:

· Start from the main screen and select the **"CLOCK"** : icon until **"TIME"** is displayed,
· select the icon : **"Partial Time"** is displayed,
· select again the icon : **"Total Time"** is displayed,
· select the icon **"ENTER"** to visualize, for about 5 seconds, the total time expressed in hours and minutes.

<< Work Time (total crane work time linked to the activation of the levers) >>:

· Start from the main screen and select the **"CLOCK"** icon until **"TIME"** is displayed,
· select the icon : **"Partial Time"** is displayed,
· select again the icon : **"Total Time"** is displayed,
· select again the icon **"Work Time"** is displayed,
· select the icon **"ENTER"** to visualize, for about 5 seconds, the total work time expressed in hours and minutes.

VERSION: how to control the software release.

- Select the icon "**ENTER**" (FX800 will be displayed), select, again, press the icon repeatedly and then select icon.
- Select the menu **"VERSION"** by using the icon then select the icon
- The software release (i.e. 02.00 09/06/05) will be displayed; by selec ting the icon you'll read the graphic version (GUI).

v		n	n	.	n	n		g	g	/	m	m	/	a	a

HOW TO CONTROL THE LOAD HOOKED ON MANUAL EXTENSIONS.

When to use the procedure:

The procedure allows to calculate if a load can be moved when using manual extensions on crane and/or hydraulic jibs.

This procedure give us back the following information:
- **YES/NO** response about lifting a load (**YES** if the load weight is smaller or equal to the maximum applicable load; **NO** in the opposite case).
- Approximate calculation of the load weight

The procedure can be activated only if:
- The procedure for the use of the manual extensions has been activated through password.
- The password has been typed in and accepted.

Procedure:

- Start from the main menu and press contemporarily the **ENTER** and % buttons.

%		1	2			2	1			3	3				

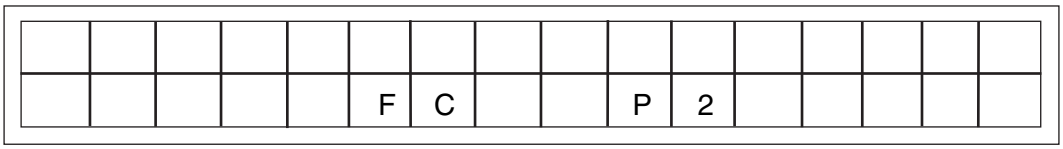
- At this point, if the crane can install manual extensions both on crane and on hydraulic jibs, the following message will be displayed.
(Note: the bold characters represent non-flashing characters).

		C	R	A	N	E	?			J	I	B	?		

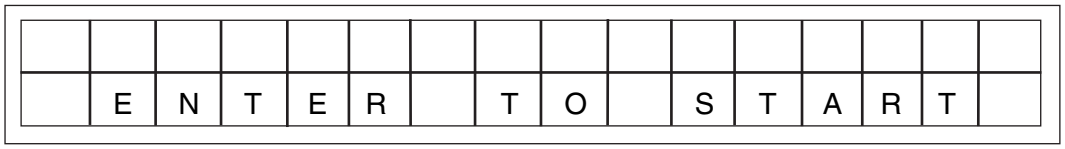
- Select **JIB** if the manual extensions are mounted on hydraulic jib or **CRANE** if they are mounted on crane, by using the **"+"**button. To confirm the selection press the **ENTER** key. The following screen will be displayed.

		M	1				M	2				M	3		

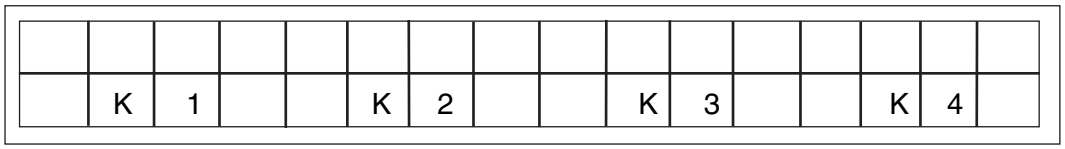
- Select the correct number of manual extensions installed by using the **"+"** button. If the crane version doesn't allow the installation of all the three manual extensions, select only the manual extensions allowed though the **"+"** button. The selection is valid both for extensions installed on crane **(CRANE)** and on hydraulic jib **(JIB)**. Press **ENTER** to confirm and pass to the following screen.



- If no load is applied to the hook, bring the outer ram to its stroke end while lifting. If the ram is already in this condition, perform anyway the procedure of lifting the ram to be able to pass to the following screen.

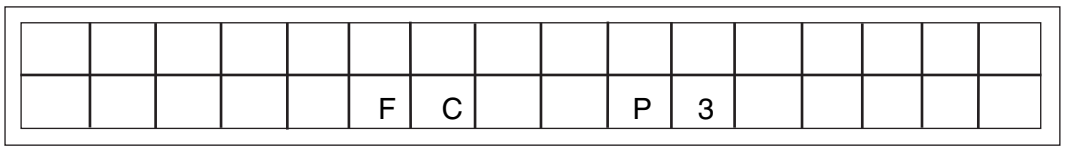


- If the manual extensions are mounted on the hydraulic jib, by pressing the **ENTER** button you can get the following screen.

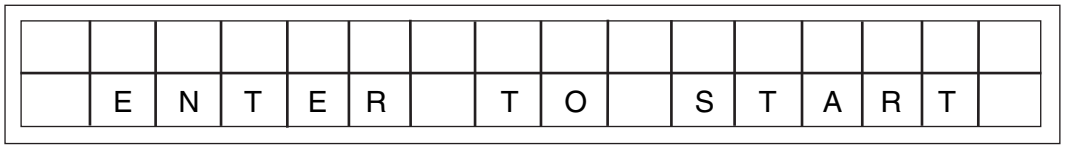


- Select the outer boom configuration, by using the **"+"** button:
  - **K1** Outer booms of the crane totally re-entered
  - **K2** Outer booms of the crane totally re-entered and jib extensions totally extended
  - **K3** Outer booms of the crane totally extended and jib extensions totally re-entered
  - **K4** Outer booms of the crane and jib extensions totally extended

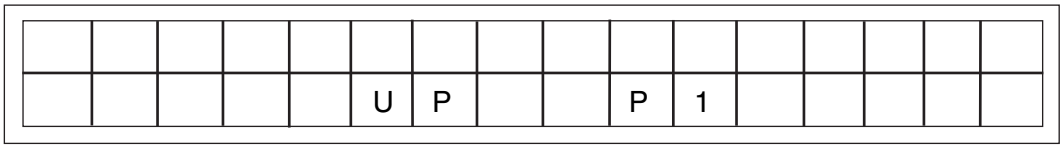
- Press **ENTER** to confirm the selected configuration. The following screen will be displayed.



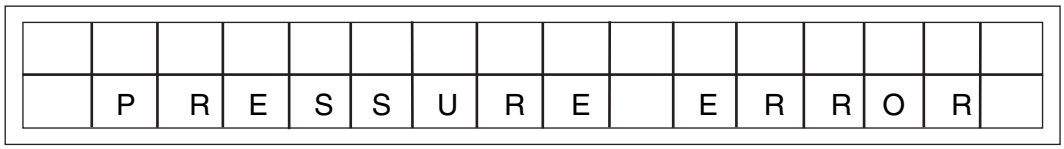
- Bring the hydraulic jib to its stroke end. If it is already in this position, lift the ram to be able to pass to the following screen.



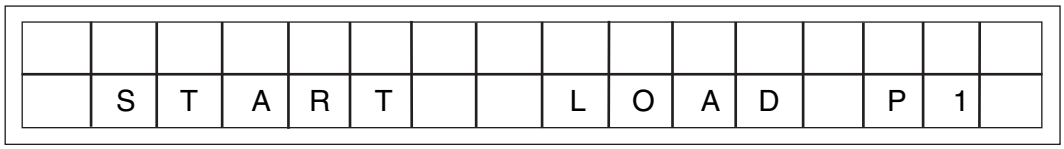
- Press **ENTER** to continue. The following screen will be displayed**.**



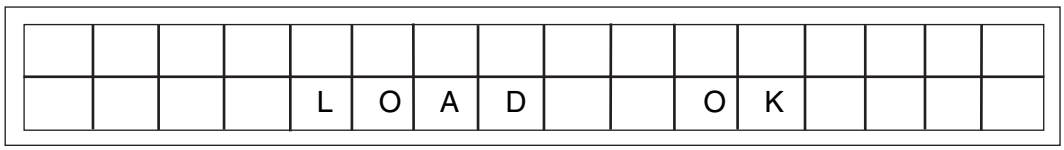
- Activate the lifting of the inner ram to eliminate possible overpressures (the manoeuvre does not determine the crane movement). When the lever is in the neutral position, the system calculates the pressure in the inner ram. Errors in the pressure will display the following message.



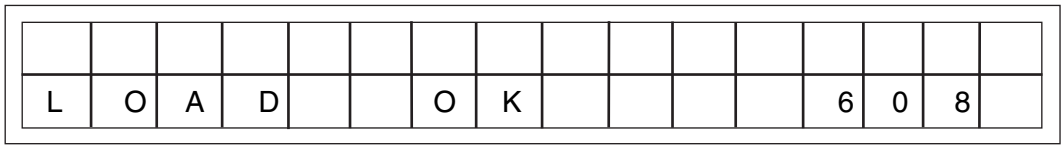
- In this case repeat the procedure (press **ENTER** to go back to the main screen). If the system does not found errors in the pressure of the inner ram, the procedure will continue with the request to lift the load.



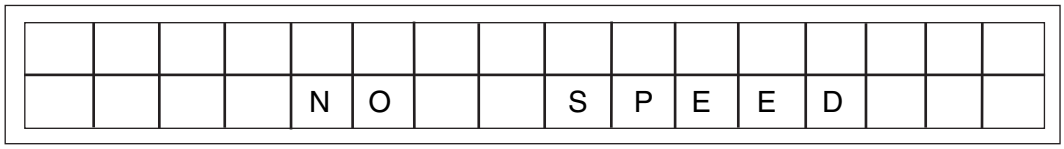
- Lift the load from the ground. If the load is accepted the following mes sage is displayed.



- By pressing the **"%"** button you can read an estimation of the load.



- If the load exceeds the limit of the selected manual extension, the following message will be displayed.



- If during the load calculation the lifting has been too quick, the system will display the following error message.

				N	O			S	P	E	E	D			

- Finally if the load exceeds the crane limit (i.e. inner ram overload), the following message will be displayed.

	N	O		L	O	A	D		C	R	A	N	E		

- When one of the above mentioned messages is displayed, the proce dure is over. Press **ENTER** to go back to the main menu (ram pressures).

16.8 Diagnostic: alarms and warnings

It is possible to install on the machine some operation improvements of the limiting device. The crane software has a reference code that can be read on the display when switching on or by following the **VERSION** procedure (see par. 16.7). For further explanations refer to Fassi service network.

All eventual problems of the electronic system are detected and shown as codes on the display of the push-button panel of the radio remote control (or displayed on the operator panels) and determine the interruption of **EV** outputs (towards the electrovalves) and the immediate halt of the machine.

The alarms can be divided in two groups:

Alarm:
non-resettable alarm; this means that the alarm can be reset by pressing on the **LMI** button only if the problem has been solved. The alarm is signalled not only on the display, but also by the fixed red light on the push-button panel, by the red tower light and by the acoustic alarm.

Warning:
resettable alarm; this means that the alarm can be reset by pressing on the **LMI** button which brings the display back to its main menu and restores the crane operation, even if the problem has not been solved. The malfunctioning is signalled not only on the display, but also by the red flashing light on the push-button panel, the red tower light and by the intermittent audible alarm.

Notes:
. In case of crane block due to overload conditions, the resettable alarms (warning) become non-resettable and determine the appearance of the signal **"Alarm".**
. On the alphanumeric panel the red light corresponds to the last led on the led band signalling the load percentage, while on the graphical panel and the push-button panel of the remote control the warning con dition is signalled by the flashing of the 100% icon.

16.9 XP DEVICE

The **XP** device works on the principle of an increase in the lifting capacity of the crane with a reduction in the dynamic effect achieved with a reduction in the speed of certain movements.

Furthermore the **XP** device can be used, not just to increase the capacity crane:

- but to exploit the reduction in the speed when moving a load that must be positioned with precision.
- and to exploit the variation in the lifting moment limiting device adjustment parameters to exit from a critical situation when moving the load (overcoming of the **90%** or intervention of the lifting moment limiting device).

(!) WARNING (!)
When the XP device is enabled, respect what is indicated on capacity plates marked with F ….XP

16.9.1 Activation and instructions for use of the XP/CR device

This device can be activated only through the push-button panel of the radio remote control by using the appropriate rotary selector shown in fig. 8.

The activation of the **XP** device is indicated with the mark **XP** displayed on the radio remote control and on the graphic panel (if fitted); furthermore the warning light over the **XP** button of the alphanumeric panel (if fitted fig. 9) and of the panel (if fitted, fig. 10) comes on.

NOTE: the **XP** buttons on the control panels are ineffective.
NOTE: when the **XP** is activated, the distributor can be enabled only through radio-remote control; therefore do not operate manually on the distributor levers (lever stop)

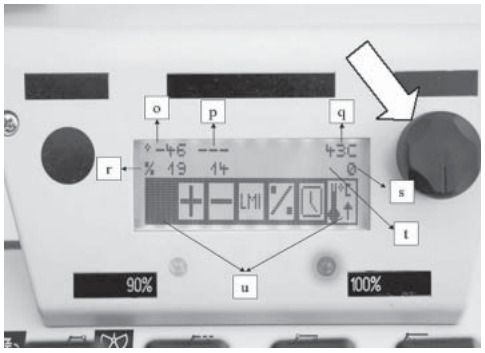


fig. 8

fig. 9

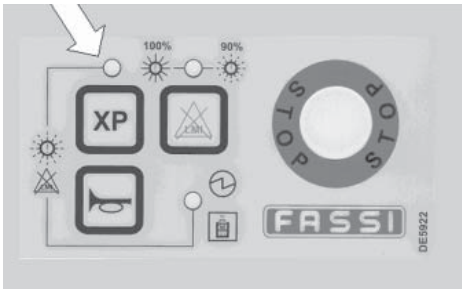


fig. 10

(!) WARNING (!)

It is recommend to release the crane controls (levers of the control console in neutral position) before activating or deactivating the **XP/CR** device, since the variation of speed is considerable and immediate; carefully operate the controls.

Refer to paragraph 14 of the Use and Maintenance manual for details on "Controls to operate the crane" .
Refer to paragraph 16 of the Use and Maintenance manual for details on "Lifting moment limiting device".

Activation of the XP/CR device on cranes with free rotation or with rotation limiting device will produce the following:

- an increase in the crane loading capacity
- a reduction in the rotation speed without increasing the torque
- a reduction in the lifting and lowering speed of the inner boom, of the outer arm and of the jib boom (if fitted)
- allows normal speed of boom sections, bucket and rotator.
- allows normal speed and lifting capacity of the winch.

Activation of the device on cranes with lifting moment limiting device for two working sectors will produce the following:

- in the **"stable"** zone working area, the same effects as with crane with free rotation
- in the **"unstable"** zone working area, a reduction in the speed without increase in the loading capacity.

Activation of the XP/CR device when 90% of the rated capacity has been reached, will produce the following:

- the yellow light on the **"led"** band signalling that **90%** of the rated capacity has been reached, goes off.
- allowing the manoeuvres that increase the lifting moment, you then have the repeat of the yellow **"led"** band and red **"led"** band of the warning lights

Activation of the XP/CR device after the lifting moment limiting device block, will produce the following:

A) The block continues
- the crane must be reset

B) The red **"led"** band of the warning light switches off and the yellow **"led"** band of the warning light usually comes on.
- the crane controls are enabled. Allowing the manoeuvres that increase the lifting moment you get the yellow and red warning lights again.

17 USE OF IMPLEMENTS

17.1 Generality

The crane, in load condition **H1B3**, can be provided with implements such as:

- Manual extensions
- Winches
- Hydraulic extensions
- Personnel baskets
- Clam 'shell buckets
- Augers

(!) When using an implement it is always necessary to check that its weight, dimension and capacity is matched to the crane performances.
For further information please refer to **FASSI GRU IDRAULICHE**

Warning and norms for crane use also apply for hydraulic implement use.

Before using a personnel basket it is necessary to provide the crane with the safety devices requested by the local norms in force, EN280 in Europe, and prior to use of the crane it has to be tested and inspected in accordance with the local legal requirements.

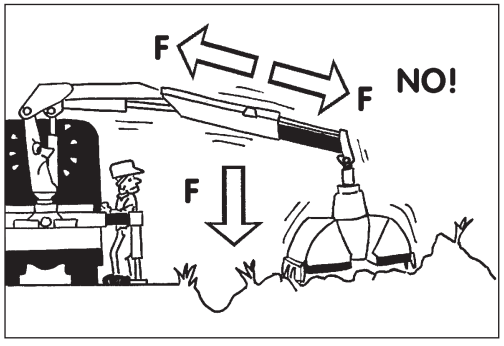
(!) When the crane is fitted with implements or laid on the truck body it is necessary to check they are locked to assure the impossibility of accidental movements and that the led signalling maximum obstruction in height (if fitted) confirms the cor rect positioning of the crane.

(!) The crane can operate, intermittently and not continuously, with lifting devices other than the hook, only on loose and light materials (not on scrap iron).

(!) ATTENTION (!)

In case of using the crane with lifting devices other than the hook, the access to the working area at the persons must be prevented.

The dimensions and the capacity of the implements must be proportioned with crane performances.



(!) WARNING (!)
CRUSHING (F) OR PUSH (F) MANOEUVRES ARE NOT PERMITTED.

17.2 Hydraulic connections for implements - supplementary hoses.

(!) WARNING (!)

To ensure that the control corresponds to the implement movement, hydraulic connections are symmetrically fitted with coupling unions. Never invert such positions: movements inversion as well as operating difficulties or unusual overload with implement itself could occur.

NOTE

When using coupling unions it is necessary to verify that there is no trace of soil, curt etc. on the unions and inside the seats so as to avoid the oil contamination and consequently wear the tightening " surface" of unions or ram seals.

17.3 Oil cooler (heat exchanger)

The crane is equipped with an oil cooler (air-oil heat exchanger) to prevent damage caused by an excessive increase of the oil temperature.

NOTE

When working in a low temperature climate, we recommend to bring the hydraulic oil up to working temperature prior to starting work, This is best done by operating the crane thru all its functions ram stroke end.

(!) WARNING (!)

The heat exchanger openings must be kept clear and clean. At no time should it be covered.

18 MANUAL EXTENSIONS

18.1 Generality

These are additional extensions, which are placed in the hydraulic extensions of the crane and of the hydraulic jib and secured by locking pins.
Manual extensions have a maximum capacity independent from the crane configuration as shown on the capacity plates.

(!) ATTENTION (!)

Manual extensions can be extracted from the rest position and be operative, once the security pins have been removed, with the outer boom in sliding position.

(!) ATTENTION (!)

- Do not stand in front of stabilisers during operation!
  Operate from a lateral position in respect of the extension movement of the manual extensions; operation from the frontal position is dangerous.
- Verify that the area is suitable for this operation and there are no unauthorized persons in the working area.
- Do not permit the extension to slide out at speed as this will damage the stroke end stops.
- Do not try to align the holes (slots) for the locking pins with your fingers; always use a suitable tool.
- When manual extensions are in place, fit the locking pins and secure them with the check pins to prevent accidental escape.

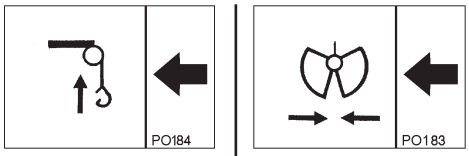
(!) Always remember that when operating with implements, their tare weight must be deducted from the capacity of the crane.

18.2 Lifting moment limiting device "ELECTRONIC" for the manual extensions (see "Setting Menù")

This procedure aims to calculate the weight applied on the manual extensions.
It is necessary to apply the same procedure **EVERY TIME** you use the manual extensions.
For its correct execution, follow meticulously the instructions reported **HERE**.
The extension limiting device **IS NOT ALWAYS ACTIVE**; on the contrary of the crane limiting device, it responds about lifting a load only if **QUESTIONED**, therefore only if you enable the procedure. Remember that the procedure is manual. In any case always refer to the capacity plates of the crane.
The limiting device for manual extensions, when interrogated, compares the real weight applied on the lifting hook (inclusive of all the accessories attached) with the value reported on the capacity plates. Such evaluation is effective only during the execution of the procedure, therefore it is prohibited to add weight or replace loads after the procedure is completed; in such case the procedure shall be executed again from the start.
In the case one or more manual extensions are added or removed with respect to the initial installation, it is **COMPULSORY** to have the crane initial configuration file modified accordingly (See Authorised Shops).
Before activating the procedure, extend and lock by a pin not only the manual extension you intend to use but also the preceding ones.
The instructions for the correct execution of the procedure of manual extenscions weight control are in the paragraph **"Setting Menù"**.

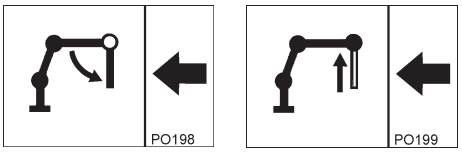
19 CONTROLS TO OPERATE THE HYDRAULIC IMPLEMENTS OF THE CRANE

IMPLEMENTS CONTROLS
1 Additional function



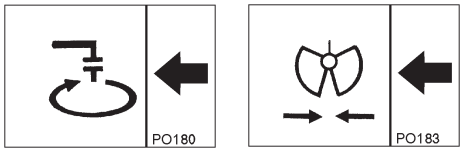
Winch | Bucket

IMPLEMENTS CONTROLS
2 Additional functions



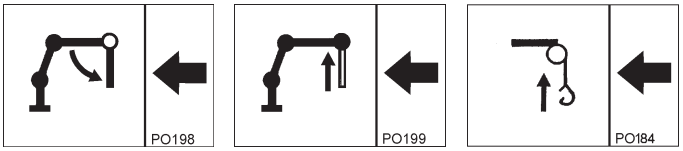
Jib outer boom | Jib extension booms

IMPLEMENTS CONTROLS
2 Additional functions



Rotator | Bucket

IMPLEMENTS CONTROLS
3 Additional functions



Jib outer boom | Jib extension booms | Winch

The plates placed over each lever define their function in relation to their movement.

(!) ATTENTION (!)
The sequence of the plates placed on the crane controls may be different.

Make sure that the lever you are going to operate correspond to the control you selected.

20 HYDRAULIC JIBS

20.1 Generality (version with lifting moment limiting device)

The hydraulic jibs, foldable behind the cab, are additional booms, with articulation and with one or more extension booms to be fitted to the last extension boom of the crane; on request the manual extensions can be installed on the extension booms of the jib.

NOTE
The weights reported in the table are indicative and can vary in relation to the fittings.

The jibs are fitted by means of the insertion of the extension connecting boom into the crane extension boom; the fixing to the crane is obtained through locking pins. The hydraulic connection to the supplementary functions of the crane, is through quick couplings.

(!) Warnings and norms for crane utilisation apply also for hydraulic jibs use.

(!) ATTENTION (!)
The loads shown on the capacity plates which concern the configuration of the crane with hydraulic jib, refer to the hydraulic jib and consequently they are the same whether the crane has its extension booms retracted or extended.

(!) Warnings and norms for manual extensions are indicated at Paragraph 18.

(!) ATTENTION (!)
It is recommended to employ lifting means adequate to the weight of the load and radius of the extensions; during this operation the operator is responsible for the machine safety. The slings or the cables used for handling the load should have the adequate capacity and length; try to avoid the load overturning by having one length passed through itself and the other one through the hook.

20.2 Identification of the hydraulic jib

The model, the version of the crane, the year of construction and the serial number are stamped on the hydraulic jib (fig. 28) in the following sequence:

L102*03*001
A B C

A = model
B = year of construction
C = serial number

20.3 Nomenclature of the hydraulic jib

Pos.	Description
1.	Connecting boom
2.	Locking pins
3.	Jib outer ram
4.	Jib outer boom
5.	Boom extension rams
6.	Extension booms
7.	Manual extension (on request)
8.	Lifting hook

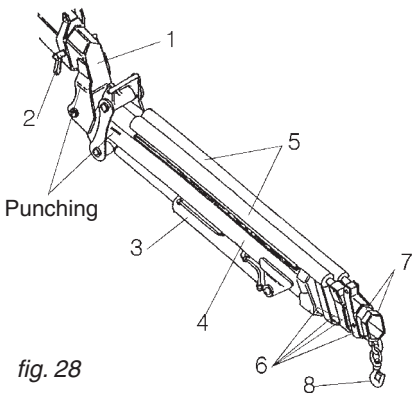


fig. 28

20.4 Manoeuvres to unfold the jib in working condition

- Operate as described to put the crane in working condition (paragraph 14.2).

By operating the corresponding levers:
- open the outer boom of the jib;
- extend the jib outer boom sliding sections;
- position the hook on the centerline of the load.

20.5 Manoeuvres to fold the jib in rest condition

By operating the corresponding levers:
- re-enter the hydraulic sections of the jib and of the crane;
- lift the inner boom to its stroke end;
- re-enter the outer boom of the jib and of the crane to its stroke end;
- operate, as described, to fold the crane in rest position.

(!) WARNING (!)
Always check and record the overall height of the crane in the folded position or in laid position in the body or on the load.
Always respect and pay proper attention that the load and dimension limits are in conformity with the road regulations.

20.6 Operations to remove the hydraulic jib from the crane

By operating the corresponding levers:
- re-enter the jib outer booms sliding sections to their stroke end;
- extend the crane outer ram to its stroke end;
- extend (of at least 1 - 1,5 m) the crane outer booms sliding sections;
- re-enter the outer ram of the jib and the inner ram of the crane to obtain the two rest brackets of the jib, either lay on the ground, or on the truck body or, if possible, on a specific rest trestle;
- remove screwing the locking pins;
- re-enter the outer booms sliding sections of the crane to free the first boom of the crane jib;
- disconnect the jib from the hydraulic circuit of the crane operating on the quick couplings.
- disconnect the electric cable of the pressure transducer and put on the specific cap.

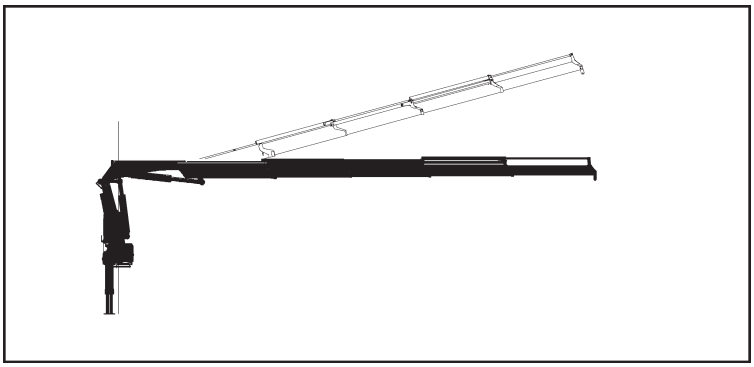
(!) Assure that the hydraulic jib is adequately stripped to avoid side turnover.

20.7 Operations to mount the hydraulic jib on the crane

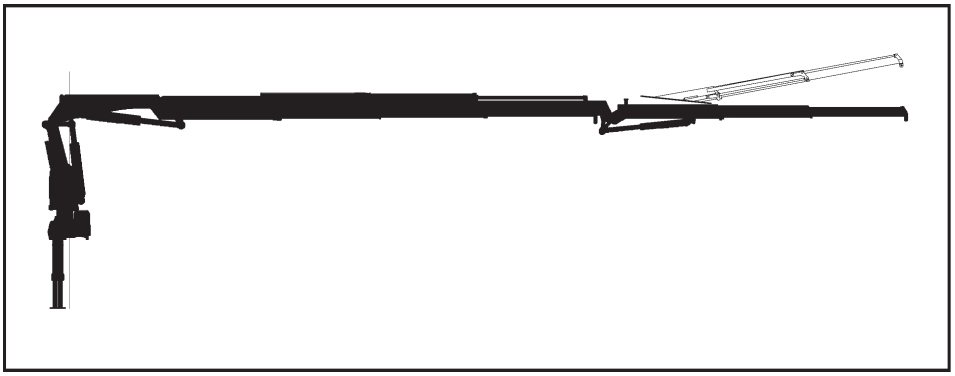
By operating the corresponding levers:
- place the extension on the vehicle or on the ground in the direction of the movement of the extension booms;
- extend the crane outer ram to its stroke end and position the extension booms of the crane not too close to the first boom of the jib in order to allow the lining-up manoeuvres and the connection of the hoses;
- connect the jib hoses to the hydraulic plant through coupling unions, following indications of Paragraph 17.2, Hydraulic connections for implements - supplementary hoses;
- disconnect the cap and connect the electric cable for the pressure transducer;
- reset the FX system which now shows Alarm # 6 by pressing the LMI button. If the correct connection has been made then the normal screen should appear with no Alarm.
- operate the outer ram of the jib and the inner ram of the crane in order to align the extension booms of the crane and the first boom of the jib thus allowing their connection;
- eventually repeat the previous operation until the fixing holes are aligned, working on the extension booms of the crane;
- insert the lock pin into the fixing holes and secure it with the check pin.

20.10 Crane with lifting moment limiting device and "pro link" (if fitted)

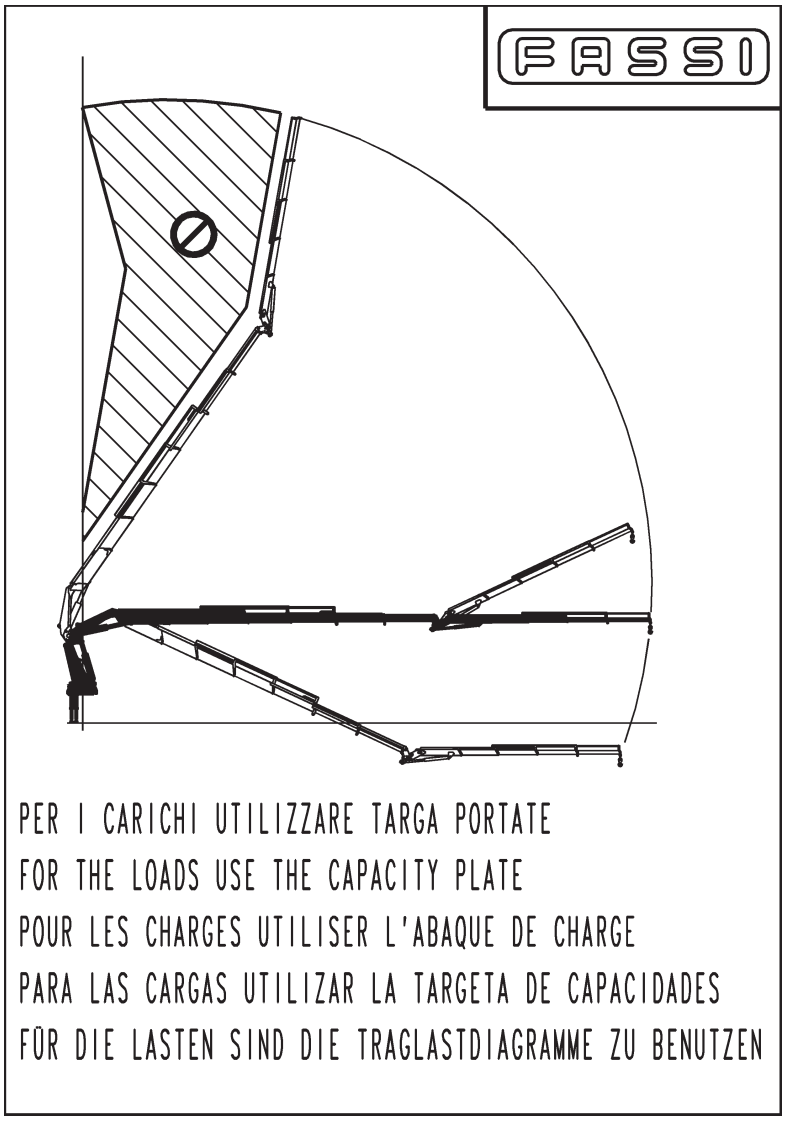
The cranes fitted with **"pro link"** can operate the outer boom and the hydraulic jib with an increased angle of about 15 degrees. In order to prevent the booms from exceeding the maximum angle over the horizontal line (generally 80 degrees) the crane is fitted with a suitable safety device.



Safety device for "pro link"
The safety device receives the signals about the inclination of the outer boom of the crane and of the hydraulic jib and transmits them to the limiting system that controls the manoeuvres; the significant values are the first and the second angle limit (**alfa1** and **alfa2** respectively about 70 and 80 degrees from the horizontal line).



Please see paragraph 16.4.3 for the working of the safety system.


FASSI
PER I CARICHI UTILIZZARE TARGA PORTATE
FOR THE LOADS USE THE CAPACITY PLATE
POUR LES CHARGES UTILISER L'ABAQUE DE CHARGE
PARA LAS CARGAS UTILIZAR LA TARGETA DE CAPACIDADES
FÜR DIE LASTEN SIND DIE TRAGLASTDIAGRAMME ZU BENUTZEN

21 WINCH (when fitted)

20.1 Generality

The winch is made of a drum that can rotate by means of a hydraulic motor, on a structure fixed on the crane. The rotation of the drum on which the cable winds is achieved by a hydraulic motor controlled by a safety check valve connected to the crane circuit. A parking brake integrated to the motoreducer group hold the load in position when the winch control lever is in neutral position.

Nomenclature of winch unit (fig. 23)

Pos. Description
1. Winch
2. Cable
3. Fixed pulley
4. Balance weight
5. Hook
6. Transmission pulley
7. Block (double-triple.... line)

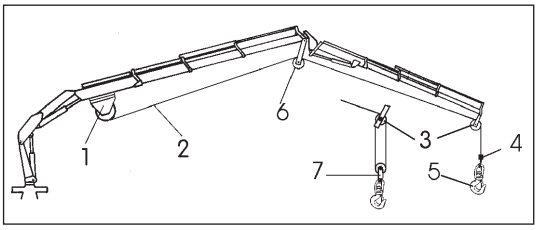


fig. 23

(!) ATTENTION (!)

Check the condition of wire rope.

(!) On winches not equipped with cable layer, check the rewinding of the cable on winch drum proceeds regularly and without overlapping: it is suggested to rewind the cable only if it is sufficiently taut.

Do not rotate the crane before the load is lifted. Lift the load vertically using the cable and not the boom in order to avoid swinging the load. With the suspended load rotate slowly and with care checking the stability of the vehicle.

21.2 Winch for crane

The identification data and the essential characteristics are marked on a plate fixed by the manufacturer and used for the CE mark which testifies its conformity to the Machine Directive (D.M.)

Manufacturer mark ...
Winch type ...
Serial number ...
Maximum line in N at the 4th layer...
Maximum speed in m/min ... or Maximum capacity pump l/min

(!) See operator winch manual supplied by the winches' manufacturer.

The winch has a maximum capacity (which cannot be exceeded), indicated by a plate, not related to the crane capacities which can also be lower.

Consequently avoid to lift, with the winch, heavier loads than those allowed by the crane capacity plate.

Note: We do not recommend using the winch with load moving (winch in or out) at the same time as the extension booms or the crane and hydraulic jib (if fitted), since it accelerates the wear of the extension guide pads reducing their life to one third compared to a standard application.

The couple limiter, installed on the winch structure, prevents that on the cable, can be created a load major to the value of maximum line at the 4th layer, quiescing all the crane controls.

(!) Under no circumstances interfere with the limiter device adjustment.

21.2.1 Winches equipped with a mechanical stroke end device

(!) ATTENTION (!)

The end stroke condition takes place when the block takes contact with the pulley structure. The operator must stop the manoeuvre before the block rotates the pulley completely with consequent activation of the load cell on the winch. Such end stroke device shall be used only under emergency conditions and not as a simple end stroke interrupter.

The mechanical stroke end device combined with the winch limiter prevents the hook bracket (or pulley/snatch block) from hitting the fixed pulley when lifting or when extending the extension booms, and thus from damaging the cable.

When the winch limiter is activated, all the crane functions are disabled.
Manoeuvres allowed:
- Rotation in both directions
- Re-entry of the crane extension boom sections
- Re-entry of the extension booms sections of the jib
- Winch rope descent

Manoeuvres not allowed:
- all other movements

fig. 26

When unwinding, an electric device maintains at least **three (3)** turns of the lifting cable wound around the winch drum on activation the following controls are desactivated.
Manoeuvres not allowed:
- Winch rope descent

Manoeuvres allowed:
- all other movements

(!) ATTENTION (!)

Limit the exit speed of the extension rams when, during the lifting, the hook bracket (or pulley/snatch block) is next to the fixed pulley, in order to avoid unnecessary stress to the cable.

(!) ATTENTION (!)

When the hook bracket (or pulley/snatch block, in case of double or triple line) and the fixed pulley are very close, and the operator needs to manoeuvre in their proximity (i.e. operations like load hook-up, arms folding, etc), we recommend to always stand side on with respect to the pulley plan (never in front or at the back) and to operate the crane at a low speed, since the contact (especially without load) can result in rapid and violent rotations of the hook group (from the fig. 26 to the fig. 27).

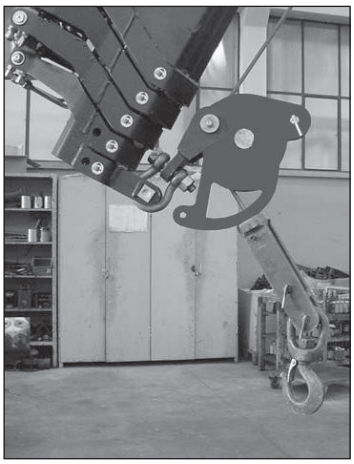
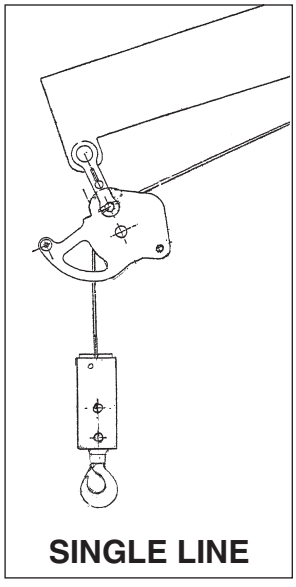


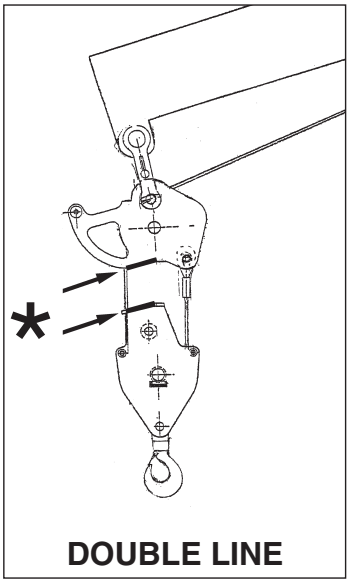
fig. 27

(!) ATTENTION (!)

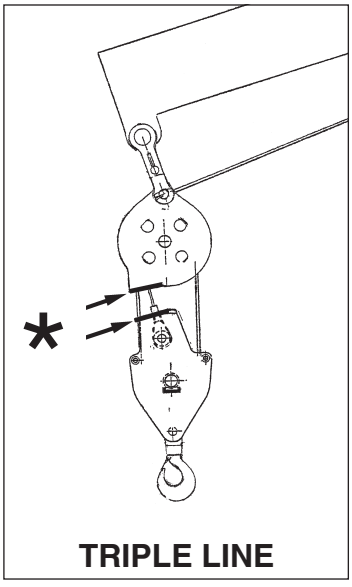
The end stroke condition takes place when the block takes contact with the pulley structure. The operator must stop the manoeuvre before the block rotates the pulley completely with consequent activation of the load cell on the winch. Such end stroke device shall be used only under emergency conditions and not as a simple end stroke interrupter.



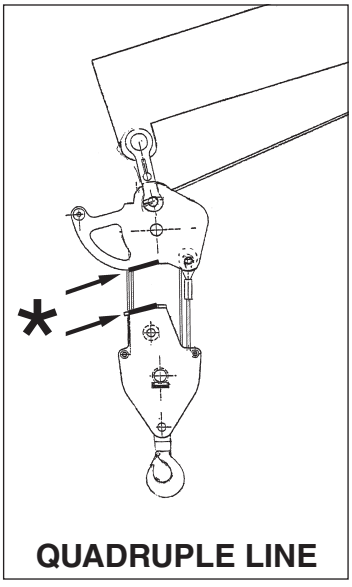
SINGLE LINE



DOUBLE LINE



TRIPLE LINE



QUADRUPLE LINE

* **CORRECT POSITION FOR THE PULLEY AND THE PULLEY BLOCK**

22 MAINTENANCE INSTRUCTIONS

22.1 Generality

To assure a long life to the crane, it is necessary to meticulously follow the maintenance instructions.

General lubrication and small repairs can be carried out by the user; repairs of a more complicated nature must be carried out by authorized service personnel.

Spare parts must be original.

Good maintenance and proper use are imperative to maintain efficient use and guarantee the safety of the crane.

At least once a year you must take the crane to a **Fassi Service Center** for a check.

(!) Before disconnecting any hydraulic hoses, ensure that there is no pressure in the hydraulic circuit. After removing hoses always mark them and their respective ports on the crane. Faulty replacement can cause damage to the rams and to the hydraulic circuit.

Respect the information supplied for maintenance and technical assistance.

Any maintenance operation must be carried out with the crane power source turned off. (in case of fixed mounting with hydraulic power pack, the electric motor has to be turned off).

Do not place limbs, fingers or any other parts of anatomy into areas of the crane, which present possibilities of shearing, without having blocked such parts of the crane.

Do not weld, drill or grind any part of the crane without the Manufacturer's authorisation.

Do not weld the fixing rods of the crane (see plate DE1574 fig. 1)

fig. 1

When repairs to, or checks of, the hydraulic circuit and of the rams are carried out, it is very important not to use, or be in the proximity of, materials which can damage the circuit or contaminate the hydraulic oil eg. metal shavings, sand or dust.

Do not use the high pressure washing on the controls (deviators, distributors, double controls, hand cable controls...), on the electronic components (boxes, control panels...), on the tanks.

Never use detergents, petrolsol or inflammable liquids, always use non flammable or non toxic liquids.

To avoid down time, it is recommended to periodically carry out the following checks.

22.2 After every 8 working hours or at the end of every working day

- Check that all safety devices are efficient.
- Check the level of the hydraulic oil in the tank.
- Check all the components of the hydraulic circuit for possible leaks.
- Check that the control and the oil diverter levers can easily be positioned; they must show no signs of forcing.
- Check the condition of shackles, hooks, wire ropes and any other lifting equipment.

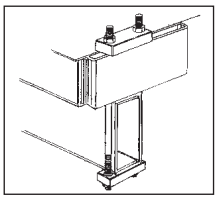


fig. 2

22.3 After every 40 working hours or atfter every working week

Check the tightening torque of the fixing rods of the crane (fig. 2).

See table at paragraph 22.5

Clean the oil filter placed in the oil tank of the crane and if any, on the pump section and pressure hoses.

NOTE The filters of fibre or paper can not be cleaned, they must be replaced.

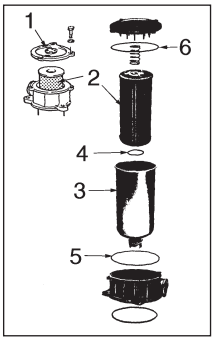


fig. 3

Cleaning of the wire mesh filter on the tank (oil return to the oil-tank) fig. 3.
- Unscrew the security bolts of the filter cover 1 and remove it.
- Extract the cartridge, clean by flushing with a non flammable, non corrosive and non toxic solvent (gas oil or other). Thoroughly dry the filter inside and out (do not use compressed air).
- Check if the cartridge has collapsed; if so, replace it!
- Remove the filter body 3 and clean it.
- Re-assemble the filter body and the cartridge: check the sealing of the 'O' ring 4-5-6; in case, replace it!

NOTE Take care that no contaminated material passes into the tank.

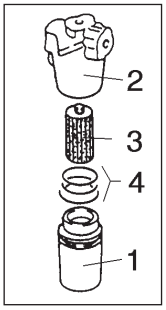


fig. 4

Replacement of the filter on the delivery line (before the distributor) fig. 4.
- When the visual indicator becomes red, replace the cartridge.
- Unscrew with a suitable spanner the filter body (**1**) from the head (**2**).
- Remove the cartridge (**3**) and clean inside the holder (**1**).
- Insert a new cartridge and re-assemble the filter body into the head checking the seal (**4**).

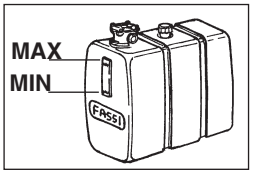


fig. 5

Check the oil level in the tank with the crane in the folded position and with the outriggers (crane and supplementary) fully re-entered. The oil level must not exceed the maximum or be lower than the minimum (fig. 5).
Top up using hydraulic oil with the same characteristics as those indicated in the table at paragraph 23.

The following lubricators have been centralized and gathered in a case (fig. 6) positioned on the base (crane distributor side):
- rack guide shoe - rotation,
- upper and lower bush of the column - column support,
- rack group - column gear,
- column support group - pendulum beam.

(!) WARNING (!)
At low temperatures, the grease shall not crystallize or, to be more precise, shall not change its characteristics. At the effective operative temperature, the grease we recommend shall have a fluidity at least equal to rating **NLGI 0** or max. 1.

(!) WARNING (!)
Centralized lubrication shall not be used when room temperature is below -10°C / -20°C.
All the lubricators mounted on the crane are protected by a plastic cap so to avoid the oil contamination.

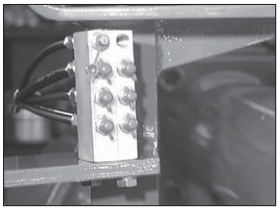
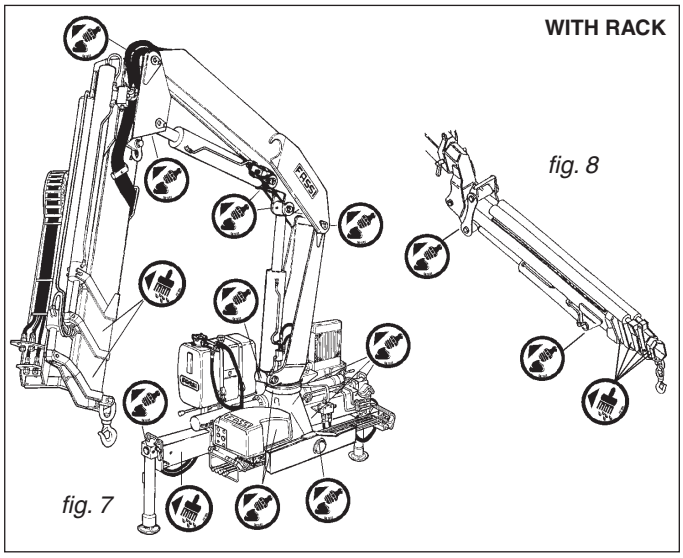


fig. 6

22.4 After every 100 working hours or more frequently in case of more intensive utilisation

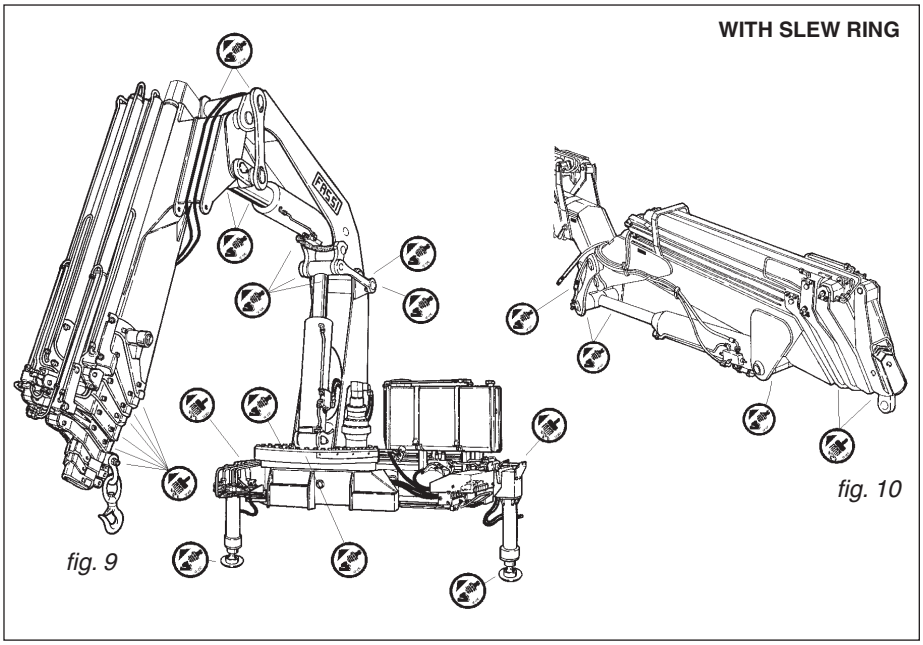
WITH RACK

Periodically grease the points indicated on the crane (fig.7-9)(and on the hydraulic jib, when fitted, fig.8-10) paying particular attention to the points not easily detected. For the sliding sections of the outrigger supports and of the extension booms guide shoes made from a special material have been fitted: to ease their movement it is recommended to smear a light film of grease on them, taking care that the surfaces of the extension booms are free from impurities such as sand etc. Top up using hydraulic oil with the same characteristics as those indicated in the table at paragraph 23.



WITH SLEW RING

Grease the slew gear to prevent friction during rotation and to ensure that it is stable by preventing water (corrosion protection) and contaminants from entering the bearings. For a better internal distribution of the grease it is advisable to rotate the crane and grease it in such a way as to see grease at the seals. Top up using hydraulic oil with the same characteristics as those indicated in the table at paragraph 23. Grease the winch cable (if fitted) after having first cleaned the cable of any encrustation (grease mixed with sand, dust, dirt etc.) The lubricant used must guarantee a good level of penetration in order to lubricate both the inside and the outside of the cable. Top up using hydraulic oil with the same characteristics as those indicated in the table at paragraph 23.



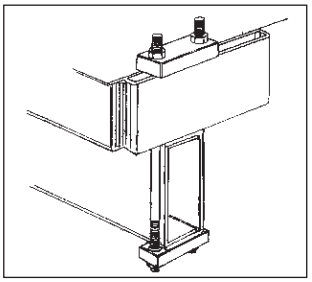
22.5 After every 500 working hours or atfte every 6 working months

CCheck the tightening torque:

- of the fixing rods of the crane; consult the following table in order to find it's value according to the bolt diameter:

Table of the tightening torques of the fixing rods of the crane on the vehicle From "C0404 Kit for crane fixing".

D. Fixing rods	Tightening torque = Nm
M22x1,5	300
M24x2,0	400
M27x2,0	600
M30x2,0	471
M33x2,0	1200
M39x3,0	1800



WITH SLEW RING

- of the slew gear screws (bolts M20 Class 12.9: Thightening torque = 620 Nm)

WITH RACK

- of the securing bolts for the ram pins and of all the other bolts and screws, where the tightening torque is not expressly indicated, consult the following table in order to find it's value according to the bolt diameter and class.

Table of the bolts tightening torque, in general, with average friction value (0,15) and average-good tightening accuracy (C).

From ... "ELEMENTS DE FIXATION - ASSEMBLAGES VISSES" (AFNOR E 25-030 1984)

Diameter Bolt = D	Class 8.8 Torque = Nm	Class 10.9 Torque = Nm	Class 12.9 Torque = Nm
3	1,06	1,56	1,83
4	2,44	3,58	4,19
5	4,83	7,10	8,30
6	8,30	12,30	14,30
8	20	29	35
10	40	59	69
12	69	102	119
14	111	163	191
16	173	255	298
18	239	352	412
20	339	499	584
22	466	685	802
24	584	858	1004
27	865	1271	1487
30	1173	1723	2016
33	1594	2342	2740
36	2046	3006	3517
39	2658	3905	4570

WITH SLEW RING

Check the rotation control motoreducer oil level. Fig. 11

- Remove the bleed plug (**1**) using a 22 mm Allen wrench.
- Remove the plug (**2**) using an 8 mm Allen wrench and the O-ring.
- Top up, if necessary, with the same type of oil as indicated in the table at Paragraph 23 via the mouth (bleed plug).
- The correct level is reached when oil starts to escape from the threaded hole in plug (**2**).
- Check the state of wear of the O-rings (replace if necessary) and then return the plugs. The lubrication oil can be drained completely by removing plug (**3**) using an 8 mm Allen wrench.

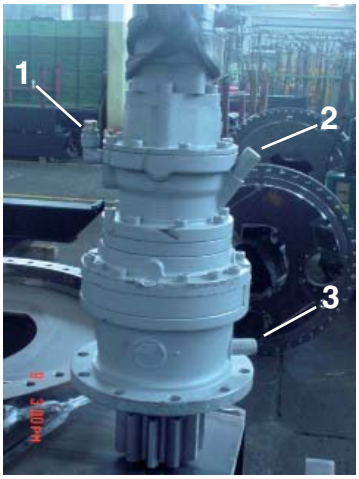


fig. 11

Check the guide shoe wear as it affects the sliding section tolerances; if the clearances are considerable, damage to the rams and the structure may occur.

Clean the air filter placed in the top of the oil tank filter cap.

Completely replace the hydraulic oil and the filter cartridges.

(!) The waste oil and the filter cartridges MUST be disposed of by authorized persons.

(!) CAUTION DANGER (!)

On the outer boom there is a mercury capsule (mercury level switch) duly protected and provided with the following warning stickers.

MERCURY IS EXTREMELY TOXIC. IN CASE OF REPLACEMENT AND/OR SCRAPPING, DISPOSE OF OR RECYCLE THE CAPSULE CONTAINING MERCURY WITH MAXIMUM CARE, AND IN ACCORDANCE WITH THE NATIONAL REGULATIONS IN FORCE.

Contiene mercurio: smaltire secondo le leggi in vigore
Hg
Es hat quecksilber: bitte beseitingen so wie gesetzlich
Mercury inside: scrap following laws in force
Contient du mercure: recycler selon les lois en vigueuer

22.7 After every 1000 working hours or after every working year

Perform: Washing, Function Testing, Testing according to the capacity plates
Check: Identification plates, Capacity plates

Checklist in accordance with ISO 9927-1

Element	**Checks to be carried out:**
Subframe Structure and fixing rods	Tightening torque of the fixing rods, wear and any deformation, actions
For crane with rack: Base Rack group, compensator *For crane with slew ring:* Base Slew ring group, compensator	Lubrication, tightening torque of the rods, wear and any deformation, actions Lubrication, tightening torque of the screws wear and any deformation, actions
Outriggers Supports, rams, base plates safety catches, hoses	Greasing of extension supports, oil-leaks, wear, actions, inspection of hoses
Rotation cylinders Cylinders, pistons, seals,	Oil-leaks, chromium plating, any deformation, inspection of hoses
Column Inner boom connection, outrigger connection, pins, bushes	Lubrication, wear and any deformation, actions
Inner boom Pins, outrigger connections	Lubrication, wear and any deformation, actions
Inner ram Cylinder, rod, piston, seals, hoses	Oil-leaks, chromium plating, any deformation, inspection of hoses
Outer boom Pins, outrigger connections	Lubrication, wear and any deformation, actions
Outer ram Cylinder, rod, piston, seals, hoses	Oil-leaks, chromium plating, strains, inspection of hoses
Extension booms Guide shoes, pins, outrigger connections	Lubrication, wear and any deformation, actions
Extension rams Cylinder, rod, piston, seals, hoses	Oil-leaks, chromium plating, any deformation, inspection of hoses
Hydraulic jib Booms, pins, outrigger connections	Lubrication, wear and any deformation, actions
Rams (hydraulic jib): Cylinder, rod, piston, seals, hoses	Oil-leaks, chromium plating, any deformation, inspection of hoses
Winch Torque limiter, brake, rope slide guide, cable, stroke end, pulleis	Lubrication, wear and any deformation, actions
Distributors, deviators, valves Control levers, forks, joints, fixing screws, lead seals	Checking of the pressure, oil-leaks, wear and any deformation, actions,
Lifting moment limiting device Valves, pressure switches, electrovalves	Checking of the pressure, oil-leaks
Power take-off, pump, oil-tank Filters, hoses	Pump capacity, checking of the pressure, oil change, replacement of filters, inspection of hoses

Oil-pressure system Hoses, hose protection devices	Checking of the pressure, oil-leaks, inspection of hoses
Implements for lifting Hooks, chains, cables, slings	Safety check, wear and any deformation, actions
Implements Wallboard forks, buckets, rotators	Oil-leaks, wear and any deformation, actions, inspection of hoses
Seat, third control station Frame, fixing screws	Access inspection, wear and any deformation, strains
Tele(radio)remote control	Test

22.7 Complete overhaul of the crane is required when 10.000 working hours or 10 years' life are reached - i.e.:

When one of the limits indicated hereunder is reached:

10.000 working hours, (i.e.: 10 years, 50 weeks a year, 20 hours a week, or 5 years, 50 weeks a year, 40 hours a week)

or

10 years' life of the crane,

a complete overhaul with in-depth structural inspection of the crane must be carried out by an authorised service centre.

22.8 Instructions for the dismantlement and the demolition of a FASSI crane

INSTRUCTIONS FOR THE DISMANTLEMENT AND THE DEMOLITION OF A FASSI CRANE

In case of demolition it is necessary to dismantle the whole machine and separate the different types of materials according to the respective waste disposals requirements.
The materials involved are the following:
- Ferrous materials: fabrications and mechanical components.
- Plastic materials: gaskets, belts, covers.
- Electric materials: windings, controls, electrovalves and similar.
- Oils and lubricants: hydraulic oil, lubricants for reducers, lubricating greases.
- For the truck follow the indications of the manufacturer
- Different material: Mercury (level sensor)

Take extreme care when slinging the components to be disassembled especially with respect to their weight.

Completely release the residual pressure in the hydraulic circuits and then fully drain the oil present in the circuits before starting the dismantlement of the relevant components. Be careful not to let the oil drop on the ground, therefore collect it in special containers, since exhausted oil must be eliminated in compliance with the waste disposal rules in force.

Disable all the electric power supplies (batteries etc.) before dismantling the components of the electric circuits.

23 TABLE OF HYDRAULIC OIL AND LUBRICANTS CHARACTERISTICS

HYDRAULIC OIL WITH HIGH VISCOSITY: ISO-L-HV		
Minimal external temperature:	maximal oil temperature:	Gradation
-35°C	+45°C	ISO VG 32
-20°C	+75°C	ISO VG 46

HYDRAULIC OIL WEAR RESISTANT: ISO-L-HM		
Minimal external temperature:	maximal oil temperature:	Gradation
-10°C	+60°C	ISO VG 32
+ 0°C	+75°C	ISO VG 46
+ 5°C	+85°C	ISO VG 68
+10°C	+90°C	ISO VG 100

GREASE (for centralized system)
Use only GREASE NILEX EP1 of the firm NILS. NOTE: Do not ABSOLUTELY mix different types of grease.

GREASE (for slew ring, extension booms, outrigger supports...)
Use only GREASE NILEX EP1 of the firm NILS. NOTE: Do not ABSOLUTELY mix different types of grease.

HYDRAULIC OIL FOR MOTOREDUCER
Classification ISO-L-CC Gradation EP ISO-VG 150

LUBRICATING OIL (for winch cable)
The most suitable here is a general-purpose lubricating oil with about SAE 30° viscosity. A lubricating oil containing non-stick additives is recommended if the cables are expected to move quickly through the pulleys. BRILUBE 50 (BRITISH ROPES - BRINDON)

(!) WARNING (!)
Don’t use greases with solid particles as “Bisulphide of Molybdenum” (not compatible with eventual teflon bushes).

24 POSSIBLE FAULTS

24.1 Generality

Many years experience of our product has allowed us to identify and classify the most common faults which occur. In most cases it requires accurate hydraulic and electric troubleshooting and simple rectification. In the following table we report the most frequent inconveniences and our suggested remedies.

(!) Checking and adjustment of oil pressures of valve settings must be carried out by an authorized service agent, under penalty of warranty forfeiture.

(!) ATTENTION (!)

In the event that the crane ceases to operate and the code "alarm" with a number appears on the Display B. Call your **FASSI authorised service centre** reporting the Alarm number with the crane model and serial numbers. If the fault cannot be cleared follow the procedure in the chapter "Controls to operate the crane" and overide the dump valve EVI.
THIS IS ONLY A TEMPORARY ACTION FOR EMERGENCIES, the crane should be taken to a **FASSI service centre** for repair as soon as possible.

TO OPERATE THE CRANE FOR TOO LONGER PERIOD WITH THE OVERIDE ACTIVATED MAY INVALIDATE THE CRANE WARRANTY.

24.2 Only operations which can be carried out by the user

Note: Any operation, other than those indicated hereunder, must be performed only and exclusively by specialized personnel from an authorized support centre, considering the potential residual risks.

FAULTS	CAUSE	REMEDIES
The crane does not rotate properly	Vehicle non in level position Lack of lubrication	Stabilize the vehicle - *WITH RACK*: Grease the bushes and the rotation guide shoe - *WITH SLEW RING:* Grease the slew ring and the pinion gear-slew ring group
The extension booms do not completely extend or work jerkily	Lack of lubrication of the guide shoes	Grease the guide shoes
Crane controls are not active	Lack of electric energy Winch stroke end active (if fitted) The rotation limiting device is activated	Check the fuse, the battery and electric circuit See 21.2 See 16.6
Vibrations in crane operations	Shortage of oil Obstructed filters	Check the level and top up if necessary Clean or replace the filter cartridge
Noteable decrease in movement speed	Obstructed filters	Clean or replace the filter cartridge

24.3 Operations to be carried out only by an authorized service center

FAULTS	CAUSE	REMEDIES
The crane does not lift the loads indicated on the capacity plate	Non efficiency of the pump	Replace the pump
	(main pressure or auxiliary) valves not properly adjusted, or worn	Check the pressure, adjust the valves or replace them!
	Ram seals are not properly fitted	Replace the seals
A boom of the crane does not hold up the load and visually lowers	The safety check valve the ram is open	Replace the valve
	Oil leaks inside the ram	Defective seals, replace them!
The crane does not rotate properly	Valves controlling the rotation not adjusted	Adjust the valves
- *WITH RACK*:	Wear of rotation guide shoe Wear of the seals of the rotation cylinder	Replace the guide shoe Replace the seals
- *WITH SLEW RING*:	Wear of the slew ring	Check the slew ring wear, replace if necessary
	Wear of the motoreducer group	Check the motoreducer group wear, replace if necessary
The extension booms do not completely extend or work jerkily	Wear of guide shoes	Check the guide shoes wear, replace if necessary
Vibrations in crane operations	Non efficient pump	Check the pump
Noteable decrease in movement speed	Non efficient pump	Check the pump

FASSI GRU IDRAULICHE SpA
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Tel. + 39 35 77.64.00 - Fax + 39 35 75.50.20

INSTRUCTIONS FOR SAFE USE OF THE CRANE

DE4236

1 Only authorized persons are permitted to operate the crane.

2 The crane must be used on firm, level ground.

3 Check that the vehicle hand brake is on and that the wheels are chocked.

4 Before operation make sure that:
- no-one is within the working area of the crane;
- the safety devices are in place and operative;
- the minimum safe working distances from power lines are observed;
- the load is correctly slung and hooked.

5 Stabilize the vehicle with the outriggers, making sure that:
- the lateral supports are fully extended;
- the wheels are in contact with the ground and the suspension is not completely unloaded.

6 Use the crane in accordance with the use and maintenance manual, making sure that:
- the load and radius are within the maximum limits shown on the crane capacity plate;
- the crane is used progressively avoiding sudden load movements;
- swinging or dragging of the load is avoided;
- the load is lifted before rotating.

7 When using implements protect the working area with a barrier.

8 The vehicle/crane are not left unless the power take off is disengaged and the load is on the ground.

9 Before driving the vehicle ensure that the outriggers are fully retracted and re-entered, the safety taps closed and the crane is in the folded position.

DE 4236
Instruction plate and safety norms

FASSI

ATTENZIONE: PRIMA DI AZIONARE LA GRU E' OBBLIGATORIO METTERE IN OPERA GLI STABILIZZATORI.

WARNING: BEFORE OPERATING THE CRANE IT IS COMPULSORY TO EXTEND THE OUTRIGGERS.

ATTENTION: AVANT D'UTILISER LA GRUE IL EST OBLIGATOIRE DE METTRE EN FONCTION LES STABILISATEURS.

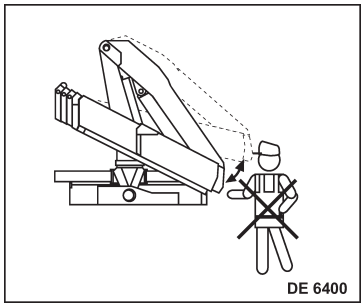
ACHTUNG: VOR INBETRIEBNAHME DES KRANS MUESSEN DIE ABSTUETZUNGEN AUSGEFAHREN.

ATENCIÓN: ANTES DE ACCIONAR LA GRÚA ES OBLIGATORIO ESTABILIZAR EL VEHÍCULO.

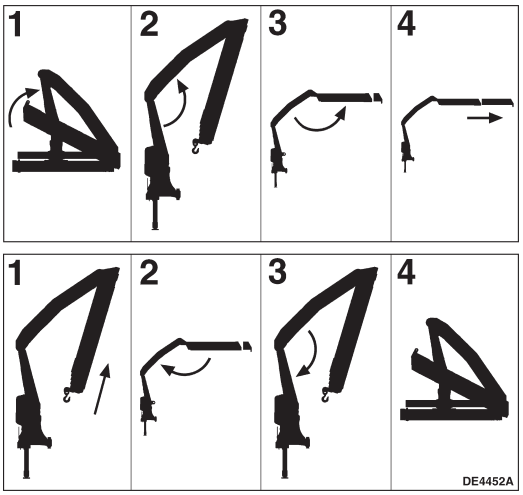
ATENÇÃO: ANTES DE UTILIZAR A GRUA É OBRIGATÓRIO COLOCAR EM FUNCIONAMENTO OS ESTABILIZADORES.

DE6723

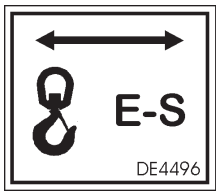
DE 6723
Warning plate to stabilize the vehicle before using the crane



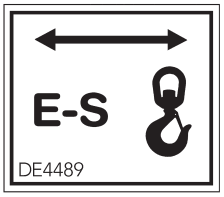
DE 6400
Do not operate from the double control side, to unfold or fold the crane



DE 4452A
Instruction plate to fold the crane into the rest condition



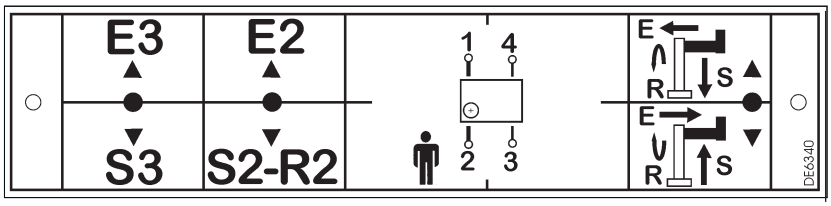
DE 4496



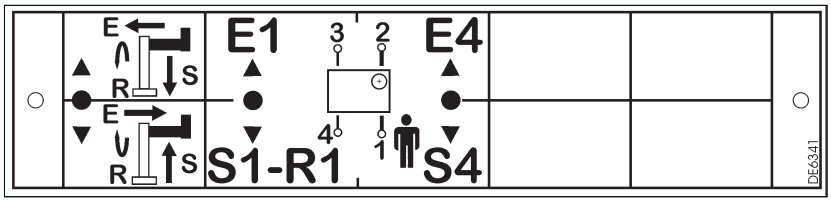
DE 4489

Oil-diverter
control plates

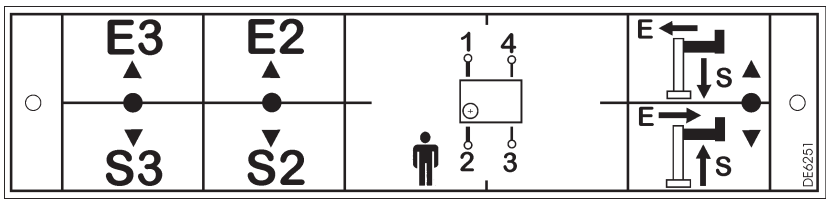
Instruction plates to stabilize the vehicle



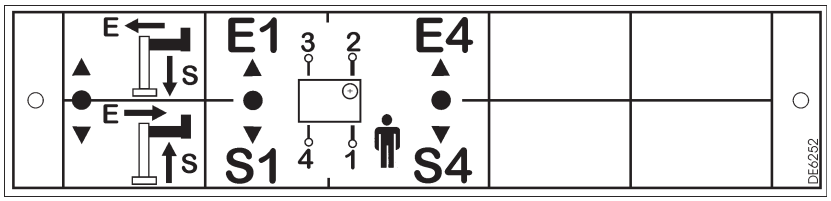
DE 6340



DE 6341

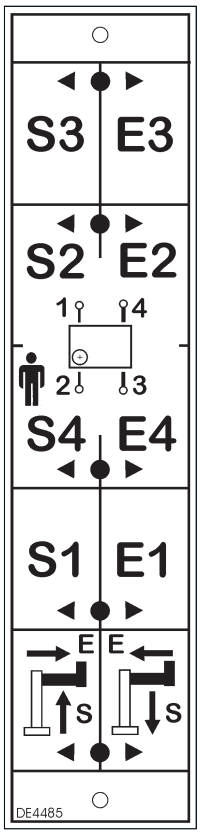


DE 6251

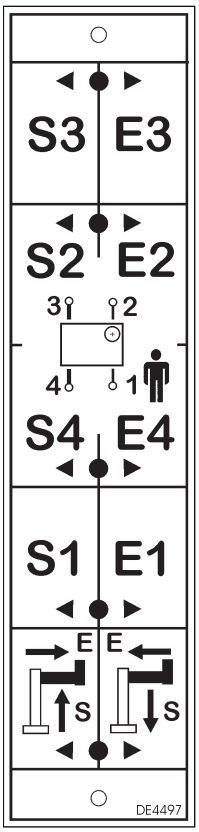


DE 6252

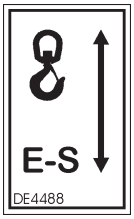
Instruction plates to stabilize the vehicle



DE 4485

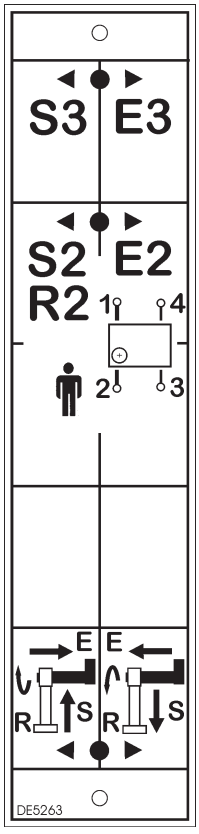


DE 4497

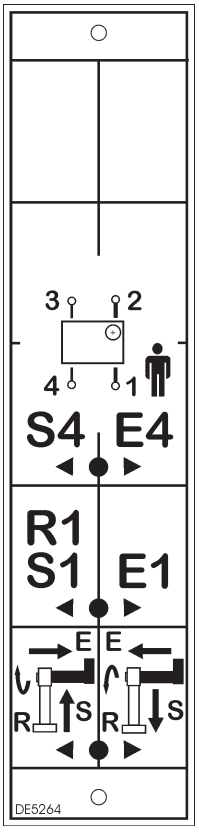


DE 4488

Oil-diverter
control plate



DE 5263

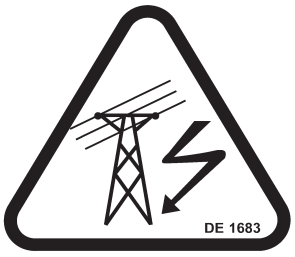


DE 5264

DE 1681
Greasing points with brush

DE 1682
Greasing points at pressure

DE 1686
Do not walk or stop under a suspended load



DE 1683 / DE 2361
Do not operate in proximity of electric high-tension lines

DE 4491
Do not operate from the frontal position, to extend the outrigger supports

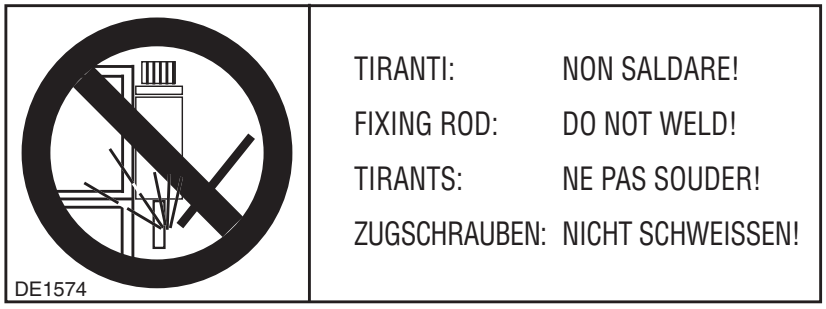
DE 2100
Danger plate for crushing of lower limbs

DE 1679
Do not walk on...

DE 1680
Do not use water to estinguish fire

DE 6409A
Warning of shearing danger

DE 4945
Warning of burn danger



DE 1574
Do not weld the fixing rods

DE 1067
Do not walk or stay under a suspended load and for unauthorized persons to be within the working area.